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ABSTRACT

Library manpower data are analyzed under five main headings: (1) employment trends, (2) expenditures, (3) salaries, (4) placements and (5) conditions of supply. The detailed, cross-section, statistical analysis focuses on the specific category of professional academic librarians. Analysis of the five main areas revealed: (1) professional employment in college and university libraries showed the fastest gain; (2) there is a heterogeneity between public and public school librarians and academic librarians; that is, there is a one-way mobility; (3) salary components of the total academic library expenditures are declining while the book share is rising; (4) the Federal share of library materials is a significant percentage of the total; (5) the number of special libraries has grown most rapidly since 1945; (6) librarians' starting salaries are lower than most other professionals; (7) salaries of academic and special librarians are higher than those of public or school librarians; (8) the number of library science degrees has tripled since 1960; (9) the number of junior college library programs has grown rapidly and (10) librarian shortages are based on the number desired; if they were based on sources of supply and effective demand, the shortages would be small. (NH)

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Final Report
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SUPPLY AND DEMAND ANALYSIS OF MANPOWER TRENDS IN THE LIBRARY AND INFORMATION FIELD

Part of
A Program of Research into the Identification of Manpower Requirements, the Educational Preparation and the Utilization of Manpower in the Library and Information Profession

by
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July, 1969

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TABLE OF CONTENTS

Page

LIST OF TABLES iii

PREFACE v

ACKNOWLEDGEMENTS vi

I. SUMMARY 1

II. METHODS OF ANALYSIS 4

III. DEFINITION OF TERMS 8

IV. FINDINGS AND ANALYSIS 11

Employment Changes 11
Trends in Expenditures 34
Salary Comparisons 45
Manpower Supply 56
Library Manpower Requirements and Shortages 63

V. CONCLUSIONS AND RECOMMENDATIONS ON LIBRARY SHORTAGES ... 68

VI. DATA NEEDS 74

VII. SOME AREAS OF FUTURE RESEARCH 77

VIII. ADDITIONAL READINGS 78

LIST OF TABLES

Table Page

1. Total U.S. Librarian Employment Population Ratios, 1959-1966 13

2. Professional Library Personnel 14

3. Librarians/Population Ratios, Public Libraries, 1939-1966 15

4. Non-Professional Librarians as a Percent of Professional, By Type of Library 16

5. Median Number of Filled Positions, Libraries Serving State Governments, 1963-64 18

6. Federal Government Full-Time Library and Archives Personnel 20

7. Estimation of the Effect of a One Unit Change in the Explanatory Variable on the Employment of Professional Librarians in Academic Libraries 26

8. Expenditure Per Person Served by Type of Library 27

9. Employment/Population Ratios by Type of Library 29

10. Librarian Employment-Enrollment Ratios Academic Libraries 33

11. Number of Libraries 35

12. Total Expenditures by Type of Library 36

13. Expenditure-Enrollment Ratios, Academic Libraries, 1959-60, 1964-65 37

14. Expenditure-Population Ratios, Public Libraries 39

Table | Page

15. Expenditure-Enrollment Ratios, Public School Libraries, 1953-54 - 1962-63 and Projected to 1974-75 41

16. Selected Data on Resources, Expenditures and Staffing of Special Federal Libraries By Region 42

17. Average Starting Salaries, Librarians and Other Professionals Compared 46

18. Starting Salaries for Selected Occupations 48

19. Average Salaries, Librarians and Other Professionals Compared 49

20. Average Annual Salary in 1964 of Women Who Graduated in 1957 51

21. Average Salaries, Directors of Academic Libraries 53

22. Special Libraries, Average Salaries 54

23. Earned Degrees, Library Science, 1952-53 1967-68 57

24. Placements of New Graduates, Five-Year Programs 58

25. Library Science Programs, Junior Colleges, by States 60

26. Degrees in Library Science by Sex, 1952-53 62

27. Estimated Shortages of Library Personnel, 1963-64 by Type of Library 64

28. Unfilled Positions by Type of Library 67

PREFACE

The study reported here, the first to be released as part of the Maryland Manpower Research Program, was conducted by Dr. August Bolino between the summer of 1967 and December, 1968. While other elements in the broadly conceived research design treat organizational and behavioral factors relating to manpower need, utilization, and education in library and information service, the present work concentrates on economic issues.

This investigation is a market analysis of librarianship based on a review of available supply and demand data on the library manpower scene. The concern of later studies in the research program will be to attempt to identify, through empirical research, points of change which may permit the field and those who function in it to influence modification and adaptation.

Dr. Bolino finds it difficult to differentiate between those who perform as professionals and those in nonprofessional roles. Even though library education has sought to suggest that only graduates of accredited library schools are qualified to perform professional roles in libraries, Bolino identifies the fact that the actual marketplace says something quite different, and that libraries remain, in the composition of their work force, very much the way they were in the forties and fifties. His conclusions regarding measures for alleviating shortages are based upon such present-day realities.

Since this report has been completed in advance of the other analytical portions of the Manpower Research effort, and was intended in part to characterize the existing scene, it cannot be assumed to represent the final recommendation or point of view of the overall Manpower Research effort. It is introduced into the recording system of the Office of Education through the ERIC system at this time in order to invite comment, critical analysis, or rebuttal on the issues treated here. For the recital of the facts which Bolino has here collected and assessed is expected to serve as the basis for discussion and debate within the field. It is further hoped that later analyses may have the benefit not only of Dr. Bolino's study and explication, but of informed reactions to what he has found and how he has explained the evidence.

Paul Wasserman
Mary Lee Bundy
Project Directors
Manpower Research Project

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In formulating and carrying out the statistical investigations of this report, I was assisted by Professor Mamoru Ishikawa, of The Catholic University of America. He was responsible for selecting the quantitative techniques, the appropriate models, the relevant variables and the specification of the functional relationships. He also made many useful comments on all phases of my work.

I should also like to thank Mr. Paul Howard, Executive Secretary of the Federal Library Committee, who made comments on an earlier draft, Mr. Robert Havlik, who helped me clarify my notions about developments in special libraries, and Messrs. Joel Williams and Henry Drennan, who were always available when I had questions about library manpower.

I. SUMMARY

This study of the supply and demand of manpower in the library and information professions proceeds along two main lines. First, we attempt to describe the labor market for librarians by presenting an analysis of recent trends in some strategic factors such as total employment, expenditures, salaries, placements, and other factors affecting supply and shortages. The basic purpose of this approach is to gain an insight into the conditions of supply and demand. Second, a detailed, cross-section, statistical analysis focuses on the specific category of professional academic librarians.

The analysis of time series data for the five areas mentioned above reveals the following findings:

1. Professional employment in college and university libraries showed the fastest gain, while public libraries seem to have emphasized the use of non-professionals. The increasing use of non-professionals is evident in all kinds of libraries.

2. Both the time-series data and the statistical analysis of cross-section data suggest that there is a heterogeneity between public and public school librarians and academic librarians; that is, there may be a one-way mobility. The public librarians may not be eligible nor do they have the desire to enter academic libraries.

3. The salary and wage components of total expenditures of academic libraries are declining, while the book share is rising.

4. The Federal share of expenditures for library materials of all kinds is a significant percentage of the total.

5. The number of special libraries has grown most rapidly since 1945, but total employment in these libraries has increased much more slowly. This slow growth results from the small median size of staff.

6. Librarians start at lower salaries than most other professionals, and the rate of increase of salary is also lower. The range of salary is small, indicating the low price paid for seniority. Men earn more than women and the gap between the two widens with experience.

7. Within the library field, academic and special library salaries tend to be higher than those of public or school librarians. Since school librarians usually work only nine or ten months per year, public librarians are the lowest paid

group. The median salary for those with library science doctorate is higher than that of most groups surveyed by the National Science Foundation.

8. The number of earned degrees in library science has almost tripled since 1960. The largest share of graduates of five year accredited programs is being employed in academic and college libraries. Only 163 doctorates were awarded between 1953 and 1966.

9. The number of library programs in junior colleges has grown at an astounding rate--from 24 in 1965 to 117 in 1967. We suspect that the graduates of these programs and other non-accredited schools comprise one labor market for librarians, while graduates of accredited schools constitute another distinct market. We surmise that the latter group are in the higher paying jobs. According to Schiller, librarians in two-year institutions are the highest paid group of academic librarians.

10. The shortages of librarians, stressed by the American Library Association and other professional groups, are based on the number of librarians desired. The 1964 estimate of ALA was that there was a shortage of over 120,000 librarians, but there was not necessarily an ability to hire this number.

11. Vacancy rates for both professional and non-professional librarians may be declining, suggesting that shortages of librarians may be exaggerated.

12. The term "shortage" is used in a variety of ways. If it is based on aspirational standards, then the total shortage is very high. If computations of shortage are based on all sources of supply and a comparison with effective demand, the shortages are considerably smaller and tolerable. Since many persons now working as librarians do not possess a master's degree and many are products of non-accredited schools, consideration should be given to accrediting schools that offer the bachelor's degree in library science.

The cross-section analysis of academic librarians is an attempt to test some pre-notions about why the number of professional librarians employed varies from one year to another and between areas of the country.

Because of the paucity of time-series data, the present study uses a cross-section data for the United States in 1961 and explains the state-to-state variation in the employment of academic professional librarians only. The variation among different states may be due to factors that distinguish one state from another, but there are factors that vary from one region to another as well as from one time period to another in one specific region. (For example, the geographical environment and the salaries of the librarians respectively.) This cross-section analysis attempts to eliminate the effects of as many of the major factors of the former type. In this model the explanatory variables are the salaries of professional and non-professional employees, the stock of librarians, college enrollments, the number of non-professional employees per academic libraries and the state per-capita income.

The number of academic and public librarians employed in the previous year was found to be very important. College size is a very important variable explaining changes in employment, but the coefficient of income per capita of the region was inconclusive. In general, the higher this income the higher the chance that a librarian will not work in an academic library. A person with a bachelor's degree not in library science working as a librarian would be more likely to leave the library field than a person with an M.S.L.S. degree.

The cross-section study shows that an increase of .4 in the use of professional librarians is associated with a rise in the use of each new non-professional in academic libraries. If this ratio is maintained by institutional custom only and if it were to persist, then it would inhibit the substitution of non-professionals for professionals, even where it is more economical. The obvious consequence would be a failure of the price mechanism in this labor market.

II. METHODS OF ANALYSIS

This study centers around a descriptive analysis of changes over time of those variables that we consider to be a good reflection of conditions of the market for librarians. Library manpower data are analyzed under five main headings: employment trends, expenditures, salaries, placements and conditions of supply.

This analysis is complemented by a separate cross-section study of professional academic librarians, which makes use of statistical tools. The cross-section study emphasizes academic libraries for several reasons. First, sufficient data were readily available to complete the kind of detailed cross-section analysis that is offered in the body of this report. Second, professional employment in college and university libraries has shown the largest percentage increase between 1955 and 1966 (see Table 2). Third, the largest share of new graduates from accredited schools is being employed in college and academic libraries (see Table 24). Fourth, it is at the college and university level that library needs are most evident and least satisfied. Fifth, the market of this type of librarians is distinct from the other two types.

A description of this cross-section study follows. The statistical procedure used is a multiple, linear regression (supplemented at one point with a log function). The explained variable is the average number of professional librarians employed per academic library in 1961-62.[1] We wish to explain the state-to-state variation. The explanatory variables (the factors that explain the state-to-state variation in the employment of the professional academic librarians) are listed below together with intuitive explanations as to why each may influence the level of employment of professional librarians.

1. Salary of professional academic librarians in 1961.
   Services of professional librarians, as in the case of any type of service (or, for that matter, any commodity that is marketed), should be sensitive to the change in their prices. The prospective

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[1] Taken from Library Statistics of Colleges and Universities, 1961-62, Institutional Data, U.S. Office of Education, OE-15032-62.

librarians would have greater incentive to enter and remain in the library field the higher their salaries.

2. Salary of the non-professional assistants in 1961.

   If the functions of professional librarians can be performed by non-professional assistants without downgrading the quality of the service, it must be safe to assume that the employers are affected in their demand for professional librarians by the salary requirement of the non-professionals. Specifically, the lower the non-professional salary, the greater the demand for non-professionals and the less the demand for the professionals.

3. Number of the professional librarians in existence.

   Given the rise in the need for professional librarians, whether and to what extent the actual employment of professional librarians takes place are governed by how many qualified librarians are available. Clearly, even if employers are willing to pay a large salary, it would be impossible to increase employment quickly if the number of professional librarians is fixed. Inasmuch as professional librarians are overwhelmingly women, whose geographical mobility tends to be limited relative to men, one would expect that this factor is quite important when considering the inter-state variation in the employment of professional librarians.[2]

4. Average number of non-professional librarians per academic library.

   If the functions of professional and the non-professional librarians are well defined and rigidly discriminated (whether or not the distinction is real), it is possible that the number of the non-professionals per each professional librarian may be stable among libraries of a similar nature (i.e., no difference in the degree of automation). The number of professionals who can be employed may be constrained by the number of non-professionals available. Thus, if it is true, one would expect that the number of non-professionals is positively correlated with the number of professionals.

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[2] It is impossible to account for all the qualified professional librarians in a state who are employed or potentially available, so we shall approximate it by using the number of professional librarians employed in academic and public libraries in the previous year (i.e., 1960). Lack of data by state prevents the inclusion of the number of the professional librarians in the public schools.

5. Amount of the library service needed.
   Clearly, the number of librarians employed should be related, though probably not proportionately, with the amount of the library service needed. As an indicator of this factor, we shall use the average college enrollment.

6. Extent of alternative employment opportunities.
   Given a potentially-available professional librarian, whether he or she would enter the labor market as a librarian depends on the size of the competing sources of employment. If the demand for labor in general is so great and the salaries in fields other than academic libraries is so high that the persons who were trained to be the professional librarians find it more attractive to enter some other field, it would follow that the employment of professional librarians would tend to fall or rise. Thus, in the states where economic activities are brisk, one would expect fewer librarians per library whereas in states of stagnant economic activity the opposite might hold. A similar tendency might hold true with respect to non-professional librarians.[3]

In reality, there are two kinds of mobility implied here. The first is whether, after one has completed a degree in librarianship, he or she would consider employment in another field; the second involves alternative employment opportunities for persons with college degrees not in librarianship who are currently working as librarians. There is no question that given a very large increase in salary, say a doubling of present salary, that considerable numbers of librarians of either type would accept other opportunities, but there may be some question whether those who have completed library education would be prepared technically or psychologically to enter other occupations, given the present differences in salaries. For them, the choice may involve enrolling or not enrolling in a library school. College graduates without degrees in library science are obviously more willing to work in a field in which they are not trained, since they are already doing so.

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[3] The next section deals with the definitional aspects of librarianship.

If the hypothesis of the complementary functions of professionals and non-professionals holds, the extent of regional economic activities would affect the number of the professional librarians employed in both direct and indirect ways. We shall use the state per-capita income as the indicator of economic activities. This is premised on the notion that the greater the economic activities of a state, the greater the alternative employment opportunities and the higher the per-capita income.[4]

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[4] The per-capita income of the states is taken from the Statistical Abstract of the United States, 1962.

III. DEFINITION OF TERMS

In this study, certain hypotheses are formulated concerning the substitutability of professional and non-professional librarians. The statistical tests of these hypotheses are influenced greatly by the ways in which these two occupational categories are defined. The task of classifying librarians is made complex by the number of types of libraries and their widely varying standards and definitions.

Generally, a professional librarian is one who holds the fifth-year librarian degree. But many professionals do not meet this criterion. Thus they are librarians but not professionals, according to standards set by the American Library Association. Others, who are in certain specialties, are professional but not librarians. "The American Library Association sets the standard definition of 'professional', but does not report their total number, while the U.S. Office of Education applies a different definition and provides the national statistical count."[5]

The U.S. Office of Education surveys of public and academic libraries defines a professional librarian as one who "performs work requiring education, training and skill in the theoretical or scientific aspects of library work as distinct from its merely mechanical and clerical aspects."[6]

Taken literally this means that a professional librarian must possess education and skills to be so classified. But surveys of public school librarians use another standard. "School librarians are certified personnel employed by the school board who have not less than six semester hours of library science, and who are assigned at least half of the regular work week to service as school librarians."[7] It is very significant that the Bowker Annual excludes "15,000 to 20,000 part-time and partly trained librarians" and includes only school librarians "with 15 or more semester hours of library science."[8] The 1962-63 survey of school librarians in school systems of 150 pupils or more shows that 6,491 (21.8 percent) of the 29,695 school librarians had completed between 6 and 14 hours of library science.[9] These persons make up nearly 10 percent of all the professional librarians who were employed in that year (68,700).

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[5] Anita Schiller, Characteristics of Professional Personnel in College and University Libraries, Final Report, U. S. Office of Education, May, 1968, p. 5.

[6] Library Statistics of Colleges and Universities, 1961-1962, OE-15032-62, 1963, p. 4.

[7] Richard L. Darling, Public School Statistics, 1962-63, OE-15020-63, Sept., 1964, p. 3.

The special librarians are special. They usually meet none of the above criteria of professionalism. According to Havlik, one-third of them are in the physical sciences and engineering, and the remainder are in such areas as health, law, business and history.[10]

The manner in which a professional is defined tends to determine the number of non-professionals. The 1961-62 U.S. Office of Education survey defined non-professional personnel as "subprofessional, clerical, maintenance staff, and excludes student assistants."[11] By this definition, one is never sure what is meant by non-professional. It could include persons who do not have formal credentials or it could include those who have roles in libraries but who are not professionally trained. Thus, it could include a college graduate who works in a library. For these reasons, the newest U. S. Office of Education survey of academic libraries adds a new category to the two shown on the 1961-62 form. It is called Other Professional Staff and is defined as "personnel, who, though not professional librarians, are in a position normally requiring at least a bachelor's degree."[12]

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[8] Bowker Annual, 1967, p. 286.

[9] Darling, Public School Statistics, 1962-63, p. 11.

[10] Robert J. Havlik, Survey Form of Special Librarians, for the National Advisory Commission on Libraries, Attachment C, 1967.

[11] Library Statistics of Colleges and Universities, 1961-62, OE-15032-62, p. 4.

[12] Library Statistics, 1966-67, OE-15065, January, 1968, p. 3.

The issues treated above make it clear that the task of defining a professional or non-professional librarian is not an easy one, hence most analysts use the U.S. Office of Education classification and counts. This we will do. Both the cross-section analysis of academic librarians and the other analyses in this report are based mainly on official statistics. But the definitions used on U.S. Office of Education survey forms are relatively imprecise, hence the final classification must be "left up to the respondents."[13] One result of relying on respondents is that some persons (for example in small public libraries) who are clerks are counted as professional librarians. Thus, the official counts of professional librarians in all fields are both overstated and understated. The solution to this problem awaits the creation of a better reporting system. Such a system is now being formulated by the U.S. Office of Education and the American Library Association.[14] Until it is a reality, we must continue to use existing data, imprecise as they are.

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[13] These are the words of a leading statistician of the U.S. Office of Education who is responsible for preparing the forms and the results of surveys. According to him, academic librarians have to have degrees, school librarians have to have library science hours and public librarians may have neither.

[14] See National Conference on Library Statistics, American Library Association, 1967.

IV. FINDINGS AND ANALYSIS

This section discusses trends in the five areas mentioned above and it details the results of the statistical analysis outlined in the previous section.

Employment Changes

Sophisticated technology is assuming a larger share of the burden in information services. Especially in the scientific disciplines, such as medical sciences, nationwide information programs are being formulated. But these influences are also beginning to be felt in other phases of the library services, and this has been one of the chief concerns of library administrators.

The computer has the greatest potential impact for library operation. Computer equipment is available now in a wide range of prices for as little as $6,000 to as much as $10 million. Present computers are adequate for a wide range of individual library tasks. "The next five to ten years are likely to see at least a 10-fold reduction in computer system costs for a given level of performance, while computer speed storage capabilities will increase several fold. These changes will accelerate the library use of computers both for 'housekeeping' tasks and for assistance to bibliographic tasks."[15]

A number of libraries, especially the larger academic and special libraries, have begun to use data processing equipment in their operations. However, the technological emphasis is on those functions that relate to processing materials and circulation control rather than to the more personal reference functions. Very few libraries have automated their information and document retrieval systems, and nearly all of the existing data retrieval systems are found in information centers.

According to the results of a recent survey, the displacement effects of library automation may be exaggerated. This study found that only three percent of the 24,000 libraries in the United States are now using computers and this finding appears to substantiate the belief that books will not be eliminated from American libraries for some time.[16] This finding is important because it suggests that the current strong demand for professional librarians will continue in the near future.

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[15] Technology and Libraries, Systems Development Corporation, November 15, 1967, p. 10.

[16] Technology and Libraries, p. 13.

In the period from 1959-1966, the number of professional librarians rose from 60.1 thousand to 80.9 thousand--a thirty-four percent increase (Table 1). In the same period civilian employment in the United States rose from 64.6 million to 72.9 million, or by only thirteen percent.[17] This is intended to show the rapid growth of library employment, but growth of national employment is constrained by the labor supply which may not be true of a single industry. This qualification is particularly relevant because the unemployment rate for 1966 was 3.9% (cf. 5.5% for 1959) which many economists consider as full employment.

Employment trends by type of library show interesting differences (Table 2). Professional employment in the college and university libraries showed the fastest gain, while public libraries seem to have emphasized the use of non-professionals. These differences may be due to differences in salaries, attractiveness and prestige and job requirements. The trend in growth of non-professional employment is pervading the medical, engineering, and law fields, as well as the libraries (Table 3).[18] Although the population/professional librarian ratio has tended to fluctuate since 1939, the ratio for non-professionals has declined significantly (from 7,920 persons served per non-professional employee in 1939 to 5,440 in 1962). The increasing use of non-professionals is evident in all types of libraries. Table 4 shows that non-professional manpower is a growing percentage of the total staffs in academic, public, and federal libraries. No comparable ratios can be computed for school libraries because they use teachers and other adults to fill staff needs. If a professional librarian is defined as a person with "15 or more semester hours of library science,"[19] then the public schools in 1960-61 used 4,559 non-professionals (18.6% of the total of 24,491 school librarians).[20]

One hypothesis to explain this trend is the relative shortage of professionals and the rising costs of operating libraries.

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[17] See Manpower Report of the President, 1968, p. 221.

[18] Of course, a count of the number of employees says nothing about the quality of service offered. The use of more non-professionals may improve or worsen the service.

[19] Bowker Annual, 1967, p. 286.

[20] Statistics of Public School Libraries, 1960-61, p. 48.

Table 1

Total U.S. Librarian Employment Population Ratios

1959-1966

	1959	1960	1961	1962	1963	1964	1965	1966
Population (millions)	177.8	180.7	183.8	186.7	189.4	192.1	194.6	199.8
Number of professional librarians (thousands)	60.1	61.2	62.7	65.6	68.7	73.3	76.7	80.9
Population per professional librarian	2,960	2,950	2,960	2,850	2,760	2,620	2,540	2,470

Sources: *The Bowker Annual*, 1962, p. 15, 1967, p. 286; *Current Population Reports*, Series P-25, U.S. Bureau of the Census.

Table 2 - Professional Library Personnel (Thousands)

Type of Library	1955-1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	% change 1959-66
Public Elem. & Secondary school	11.9 4.1			19.4[1]	19.7	19.9[1]	21.5	23.2[1]	25.0	27.0	28.0		44.3
Nonpublic Elem. Sec. school				3.1	3.2	3.4	3.6	3.9	4.2	4.5	4.7		51.6
College and University	8.5			8.8	9.0[1]	9.7[1]	10.3[1]	11.0[1]	11.9	12.0	14.1		60.2
Public Library	13.8 3.5			19.2	19.5[2]	19.8	20.2[2]	20.4	20.8	21.2	21.6		12.5
Special Library				9.6	9.8	9.9	10.0	10.2	11.8	12.0	12.5		30.2
All Libraries				60.1	61.2	62.7	65.6	68.7	73.3	76.7	80.9		34.6

Note: Includes the number of full-time equivalents, but excludes 15-20,000 part-time and partly trained and public and nonpublic school librarians with less than 15 semester hours of Library Science.

Source: The Bowker Annual, 1965, 1967

[1] Actual data based on USOE Surveys. [2] Based on surveys of libraries serving populations of 35,000 or more.

Table 3 - Librarians/Population Ratios Public Libraries 1939-1966 (Selected Years)

	1939	1945	1950	1956	1960[1]	1962	1965
All staff	28.1	29.4	35.4	41.0	35.5	55.7	
Professional librarian(thousands)	13.3	12.2	14.1	15.7	10.7	19.9	21.2
Nonprofessional (thousands)	9.9	12.1	15.5	19.1	N.A.	23.9[2]	N.A.
Subprofessional (thousands)	4.9	4.5	5.9	6.3	N.A.	12.0	N.A.
Population served (millions)	79.1	89.9	115.0	117.6	112.6	130.1	181.0
Population served per professional	5,950	7,370	8,160	7,490	10,520	6,540	8,540
Population served per nonprofessional	7,990	7,430	7,420	6,160	--	5,440	--
Population served per subprofessional	16,140	20,000	19,500	18,700	N.A.	10,840	N.A.

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[1] 1960 data based on sample of 823 libraries.

[2] The total of 35,900 includes sub and non professionals. The nonprofessionals have been estimated as two-thirds of the total.

Sources: Henry T. Drennan and Sarah R. Reed, "Library Manpower," ALA Bulletin (September 1967); Statistics of Public Libraries, 1962. U. S. Office of Education, OE 15051, 1965.

Table 4

Non-Professional Librarians as a Percent of Professional By Type of Library

	1939	1945	1950	1956	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967	1967-1968
Academic					100	101	105	108	112	116	123		
Public	74	99	110	122			120						
Federal								59		67		76	88

Source: See sources to Tables 3, 6, 10.

The labor cost (salary) of the professional librarians is often too high for the libraries to bear, given the funds available, hence, the substitution of non-professionals who are willing to accept lower salaries.

It is possible that libraries are hiring non-professionals because they do not have enough dollars to hire professional librarians, but another explanation is that there are insufficient professionals to fill the demand, hence others are hired who are not professionally trained. One solution is to hire college graduates without library degrees. This situation appears to be more true in public and school libraries.

Special libraries are probably the fastest growing sector in the library field. According to the American Library Directory, their number grew from 558 in 1944 to 4,011 in 1965. However, although the number of special libraries has grown phenomenally, the number of professional employees in special libraries has grown little. The mail and telephone survey of special libraries completed for the National Advisory Commission on Libraries shows that fifty-two percent of all special libraries have one or two employees, and that over ninety percent of all special libraries have fewer than ten employees.[21] Table 5 shows that the situation in libraries serving state governments is similar. The median number of employees in these libraries is less than three.

There has been a very significant increase in the number of special federal libraries since 1940. Of all special libraries in existence, two-thirds were established since Pearl Harbor, and one-third between the War of 1812 and World War II. The chief reasons for growth of federal libraries are the great depression of the 1930's and military developments since 1940. In the 1930's many new civilian agencies were set up with libraries by the Roosevelt administration, and since 1940 military library establishments have outpaced the growth of libraries in civilian agencies, although there has been a slackening of the rate of growth in the 1960's.[22] In 1965 there were 3,884 positions listed in the 355 special libraries. Of these 927 (twenty percent) were non-professional positions,

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[21] See Special Libraries--Problems and Cooperative Potentials: Report to the National Advisory Commission on Libraries by R. J. Havlik and Bill M. Woods, to be published in Libraries at Large, R. R. Bowker Co., 1969.

[22] See Frank Schick and Paul Howard, Survey of Special Libraries Serving the Federal Government, U. S. Office of Education, OE-15067, 1968, pp. 5-10.

Table 5

Median Number of Filled Positions Libraries Serving State Governments 1963-64

	Professional Positions	Nonprofessional Positions	Number of Librarians
Statutory Government Libraries	2.6	1.3	91
Statutory Legislative Reference	1.2	1.3	11
Departmental	1.3	1.3	136
Supreme Court	1.7	1.5	20
Lower Court	.1	1.4	30
Hospital	1.3	.1	90
Correctional Institutions	.8	1.0	3
Museums	.1	1.3	8
Total U. S.	1.3	1.2	389

Source: "Number of Special Libraries Serving State Government," U. S. Office of Education, 1965 (Unpublished).

and 2,957 were professional. Only 42 positions were in the GS-16 and above super-grade category and all but one of these were located in the three national libraries. More than one-half of the heads of these 355 special libraries were in the GS-9 to GS-11 category which at that time paid a salary of$11,500.

Table 6 shows the number of full-time library personnel in federal libraries for selected years. It shows that the number of professional librarians has leveled off while the number of technicians has risen from 1,950 in 1962 to 2,931 for 1967. For the entire five year period, the number of federal personnel rose by 1,377, and five-sixths of this growth was in the library technician category. These statistics are not to be taken as definitive, however, because some federal agencies have interpreted civil service regulations loosely causing job descriptions and functions to become distorted. The master's degree is automatically qualifying for the GS-9 rank, but the bachelor's degree is not; consequently some of the movement in grades results from on-the-job training or from passage of the qualifying examinations. The problem can best be seen by contemplating the fact that eighteen percent of the persons in the federal government are in GS-7 grade and below, and one-third of these are GS-5 and below. In October 1967, 534 librarians in the 1410 series were at the GS-7 level; 104 were at the GS-5 level.

These facts were made known by an analysis of job functions that is being carried out by the U.S. Civil Service Commission, that stems from manpower shortages of library personnel. The Commission is attempting to determine what professional functions should be classified in what librarian series. This purification process of library work will tend to reduce the number in the 1411 series. Since one-half of the persons in the 1410 series do not have a master's degree, a significant number of the 3,314 professional librarians may be affected.

Another important manpower trend in the federal government is the age of librarians. Because the majority of federal libraries were established between 1940 and 1965, a significant percentage of federal librarians are in the sixty to sixty-five year age category, and many of them will be retiring very shortly. For example, twenty-five percent of the 165 librarians of the Veteran's Administration are over sixty years old. Because so many federal librarians will be retiring soon, there will probably be an upgrading of personnel. This upgrading follows from the more restrictive requirements that are being set down now by the Civil Service Commission. The new federal librarian will be better qualified and better paid. One example of this upgrading can be seen in the growth of technical information specialists. The number rose from 204 in October 1966 to 399 in

Table 6

Federal Government Full-Time Library and Archives Personnel

	Civil Service Series	Oct. 31 1960	Oct. 1 1962	Dec. 1964	Oct. 1966	Oct. 1967
Professional Librarians*	(1410)	3,234	3,311	3,387	3,280	3,314
Library Assistants**	(1411)	1,668	1,950	2,291	2,511	2,931
Archivists Professional	(1420)	. .	337	346	318	308
Archives Assistants	(1421)	. .	470	465	437	493
Technical Information Specialists***	(1412)	. .	. .	. .	204	399
Total		4,902	6,068	6,489	6,750	7,445

*There have been some redefinitions of 1410 personnel to the 1411 series, resulting from an analysis of job functions that stems from a manpower shortage of library personnel.

**Now called library technician and includes library aides.

***New job classification.

Source: 1960, 1962 and 1964 data are unpublished printouts from the Civil Service Comm.; Occupations of Federal White Collar Workers, As of October, 1966, MS,56-6; As of October, 1967, SM,56-7, Manpower Analysis Section, Civil Service Commission.

October 1967. The salaries for those in the 1412 series are higher than those in the older 1411 series. Four percent of the 1412 personnel are in GS-16 and above, compared to only two percent in the 1411 series.

There might be some salient labor-market factors that underlie the trends described above. We are especially interested in how employment is responsive to a change in salary. Toward this end the next section is an attempt to evaluate the importance of salary change, holding other relevant factors constant. Our pre-notions concerning how each explanatory variable affects employment have been discussed in the section on "Methods of Analysis."

The Employment of Academic Librarians
A Cross-Section Analysis

This cross-section analysis aims to evaluate the variation in the average number of professional librarians employed (the explained variable) that is explained by the six explanatory variables that are listed below, with intuitive explanations as to why each may influence the level of employment.

1. Average salary of the professional academic librarians in 1961:

The service of professional librarians should be sensitive to the change in its price. Prospective librarians would have greater incentive to enter and remain in the library field the higher the salaries while, on the other hand, the employers have less incentive. The actual level of employment and the actual salary reflects the conditions of supply and demand for the service. But these do not yield information regarding how librarians behave as the salary level changes (i.e., supply schedule) or regarding the behavior of the employers. It seems reasonable to assert that the salary level exerts some influence on the level of employment.

2. Average salary of the non-professional assistants in 1961:

If the functions of professional librarians can be performed by non-professional assistants (without downgrading the quality of the service), it would be safe to assume that employers are affected in their demand for the professional librarians by salary requirements of non-professionals. Specifically, the lower the non-professional salary, the greater the demand for the non-professionals and the lower the demand for the professionals.

3. The stock of professional librarians:

Given the rise in the need for the professional librarians, the actual employment of professional librarians depends on how many qualified personnel are available if a suitable salary is offered. If few professional librarians are available, raising the salary offered may or may not increase employment. Since professional librarians are overwhelmingly women (whose geographical mobility tends to be limited relative to men), one would expect this factor to be quite important when inter-state variations in employment are considered. But it is impossible to account for all the qualified professional librarians in a state, hence we shall approximate the number by using the employment of professional librarians in academic and public libraries in the previous year (i.e. 1960). Lack of data prevents the inclusion of the number of the professional librarians in the public schools.

4. Average number of non-professional librarians per academic library:

If the functions of professional and non-professional librarians are well defined and rigidly discriminated (whether or not the distinction is real), it is possible that the number of the non-professionals per professional librarian may be stable among the libraries of similar nature (e.g. no difference in the degree of automation). The number of professionals who are employed may be constrained by the number of non-professionals available. In this sense one would expect that the number of non-professionals is positively correlated with the number of professionals.

5. Extent of service requirement:

The number of librarians used should be related, though probably not proportionately, to the amount of library service needed. As an indicator of this factor, we use the size of college enrollment.

6. Extent of alternative employment opportunities:

Given a potentially available professional librarian, whether he or she would enter the labor market as a librarian depends on the number of alternative sources of employment. If the demand for labor in general is so great and the salaries in the non-library field so high that the persons who were trained to be the professional librarians find it more attractive to enter the non-library field, it would follow that the employment of the professional librarians would be affected. Thus, in states where economic activities are brisk, one would expect fewer librarians per library whereas in the states of stagnant economic activity the opposite would hold. A similar tendency would tend to hold true with respect to non-professionals. Hence, if the hypothesis of the complementary functions of professionals and non-professionals holds, the extent of regional economic activities would affect the number of the professional librarians employed. We use the state per capita income as the indicator of these economic activities.

Since time series data in the library and information field are quite scarce, this experiment uses cross-section data. Our approach makes two assumptions: (1) The explained variable is related to the explanatory variables in a linear form. This implies that the amount of change in the former per unit of change in the latter is the same regardless of the value of the explanatory variable. Thus, for example, if we found that the change implied in the employment of professional librarians is one when non-professional librarians increase by ten from, say, five to fifteen, the change of the former is still one when the latter increases by the same number ten but from *twenty to thirty*. (2) Interactions among the explanatory variables which result in changes in the explained variable that are greater than the sum of the separate effects are ignored.

Thus, this approach envisions the true relationship between the explained variable and the six explanatory variables as expressed in the mathematical form:

$$E_{p61} = \beta_o + \beta_1 (E_p + E_{pp})_{60} + \beta_2 E_{Np61} + \beta_3 P_{p61} + \beta_4 P_{Np61} + \beta_5 C_{61} + \beta_6 Y_{61}$$

where the symbols stand for the variables as follows:

1. E_{p61}: Average number of professionals employed per academic library in 1961.
2. $(E_p + E_{pp})_{60}$: Total number of professional librarians employed by the academic and the public libraries in 1960.
3. E_{Np61}: Average number of non-professionals employed per academic library in 1961.
4. P_{p61}: Average beginning salary of new graduates of library schools (fifth year degree) without experience in 1961.

5. P_{Np61}: Average (among the academic libraries within a state) of the highest salary received by the non-professional assistants in 1961.

6. C_{61} Average size of college enrollment in 1961 which the academic libraries serve.

7. Y_{61} Per-capita state income in 1961.

Each of the Greek letter β's (beta) in the equation from β_1 to β_6 stands for some numerical value indicating the extent of change in the explained variable that occurs with a one-unit change in the specific explained variable designated by the subscript. So, for example, if an increase of college enrollment of 100 students results in an increase of professional librarian employment by 1, the β_5 is +.01.

We have stated that we envision the relationship to be of a linear form; but in reality, such a relationship may be completely false. The true relationship may be non-linear (e.g. E_{p61} may be an exponential function of some or all of the explanatory variables). Or it may be because there are other important explanatory variables that were erroneously omitted (e.g. in addition to the above six, the average age of the librarians may be an important variable). Whether or not the assumed form of relationship is true can never be determined with complete certainty when sample data are used. At best we can only make inferences about the true relationship from the relationships observed among the sample observations.

The index to be used to decide whether the assumed relationship is plausible is the coefficient of multiple determination (R^2) of the sample data. This is the ratio of that part of the variation in the explained variable which was "explained away" by the corresponding variation in the explanatory variables to the total variation in the explained variable; hence, this index indicates what proportion of the variation in the explained variable is accounted for by the changes in the explanatory variables. It follows then that the greater the value of this index the more one is inclined to regard the assumed relationship to be valid.

With the inclusion of six explanatory variables as listed in the previous section, and thirty-nine observations,[23] our

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[23] After omitting the states for which any of the data needed was unavailable, we were left with thirty-nine states. The omitted states were: Alaska, Delaware, Idaho, Maine, Montana, Nevada, New Hampshire, North Dakota, South Dakota, Vermont and Washington.

R^2 is .8619 which means that, summing the independent "effect" of each explanatory variable, it "explained" eighty-six percent of the variation among thirty-nine states in the average number of the professional librarians employed by the academic libraries.

Applying the statistical test of significance this R^2 leads us to suspect that the absence of the combined effect of the six factors on the employment of the professional librarians is rather unlikely.[24] This implies that some or all of these six factors are indeed important in that, at least, they change hand in hand with the changes in the explained variable.

The next question is, "Which of them are important?" Table 7 shows the results of the estimation of the effect of each explanatory variable, using the method of least squares. Each of the regression coefficients in the second column indicates how much changes in the employment of professional academic librarians are estimated to change as the result of a one unit increase in the explanatory variable. Specifically our estimation may be expressed as follows:

1. Among the states a change of 10,000 in the number of professional librarians employed by the academic and public libraries in the previous year is associated with a change (in the same direction) in the average number of professional librarians in academic libraries of 3. If our approximation is valid, this implies that an increase in the stock of qualified librarians by 10,000 leads to an increase of 3 in the employment of professional librarians in academic libraries.

The small regression coefficient (3 in 10,000) may result partly from our definition of stock (the employment of public and academic libraries). The fact that over one-third of all recipients of first professional degrees from accredited schools are employed in academic libraries, and that only seventeen percent of all librarians are employed in these libraries may mean that the graduates of non-accredited schools may have more difficulty in finding employment in academic libraries.[25] There is also the possibility of immobility of librarians within the library field. The public librarians may not be eligible nor do they have the desire to enter academic libraries (and vice-versa). Therefore, our explained variable is insensitive to

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[24] This procedure is justified only if two assumptions are met: the data must be a random sample of cross-section observations and the population from which the sample is drawn must be normally distributed.

[25] It may be that this difficulty is related more to the absence of a master's degree than to the question of accreditation.

Table 7

Estimation of the Effect of a One Unit Change in the Explanatory Variable on the Employment of Professional Librarians in Academic Libraries

Variable	Regression Coefficient	Standard Error	t-score
1. $(E_p + E_{pp})_{60}$	.00034	.00033	1.0182
2. E_{Np61}	.38837	.09710	3.9995
3. P_{p61}	-.00004	.00056	.0710
4. P_{Np61}	.00027	.00035	.7766
5. C_{61}	.00106	.00022	4.8654
6. Y_{61}	.00050	.00072	-.7026

Table 8 Expenditures Per Person Served by Type of Library

Type of Library	1939	1945	1950	1952	1954	1956	1958	1959	1960	1961	1962	1963	1964	1965	1966	1968
Expenditure per student academic libraries	$15.31			29.23					40.34	44.02	47.13	50.95	51.25	51.89	54.23**	
Expenditures per person public libraries	$ .62	.70	.96			1.45			1.77		2.14			2.69		
Expenditures per pupil public school libraries*					.98			1.60				2.28			2.84**	3.19**
Book expenditures per student--academic libraries									12.03	13.45	14.50	15.15	16.50	17.20	18.82	
Book expenditures per person public libraries	$ .11	.12							.24		.30			.92		

*Book expenditures only. Total library expenditures are part of the total for the school.

**Estimated Sources: Library Statistics, 1967; American Library Annual, 1956, p. 73; Bowker Annual, 1960, p. 5; Statistics of Public Libraries, 1962, OE-15051, 1965; Bowker Annual, 1967 p. 59.

changes in the number of public librarians available. It we had used the number of academic librarians alone as the explained variable, regressed on the same explanatory variables, it is possible that the regression coefficient might have been greater.

This heterogeneity between public and public school libraries and academic libraries, if it exists, may be due to the difference in clientele, the different number and quality of books and information required. The heterogeneity of these two types of libraries is suggested by an analysis of Tables 8 and 9. In Table 8 it can be seen that total expenditures and book expenditures per person for public libraries and public school libraries are considerably different from those in academic libraries. Table 9 shows that enrollment per professional staff for academic libraries rose twenty percent between 1960 and 1966, while the enrollment per elementary and secondary school librarians declined nearly twenty-one percent in the same period. These contrasting trends suggest a heterogeneous universe of libraries.

2. A .39 increase in employment of professional librarians is associated with an increase of one non-professional librarian in academic libraries. This suggests the presence of proportionality in the use of the services of these two types, though it is not obvious whether it is a functional relationship or merely a statutory requirement.

3. The small value of the regression coefficient for the variable, beginning salary of graduates of five-year programs, (the estimate of β_3) leads us to suspect that the price variable is unimportant in explaining changes in employment.[26] This may be due, on the demand side, to institutionally-set salaries and/or on the supply side, to a relatively rigid immobility of professional librarians who are overwhelmingly women. However, a definitive statement must await further study in which, for example, the possible intercorrelation between this and other explanatory variables is taken account of. This problem will be discussed later.

4. Salary of non-professional librarians is another variable which showed little correlation with the employment of academic librarians. Again, however, a definitive conclusion as to the importance of this variable must await additional analyses.

5. An increase in college or university enrollment of one hundred is associated with an increase of about one professional

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[26] The results of the most recent survey of academic salaries is discussed below in the section on "Salary Comparisons."

Table 9: Employment/Population Ratios by Type of Library

	1939	1945	1950	1956	1959	1960	1961	1962	1963	1964	1965	1966	Percent change
Population per prof. librarian (all libraries)					2,960	2,950	2,930	2,850	2,760	2,620	2,540	2,470	-16.6
Enrollment per prof. staff (academic libraries)						378	372	378	388	401	402	454	20.1
Enrollment per non-prof. staff (academic libraries)						340	368	361	366	361	366	369	8.5
Enrollment per elem. and sec. school librarians							1,892	1,775	1,700	1,595	1,530	1,500	-20.7
Population served per prof. librarian (public libraries)	5,960	7,380	8,130	7,470		10,520		6,530			8,500		42.7
Population served per non-prof. librarian (public libraries)	7,920	7,430	7,400	6,140				5,440					-45.6

Sources: Bowker Annual, 1957, 1960; Henry T. Drennan and Sarah Reed, "Library Manpower," ALA Bulletin (September, 1967); Library Statistics (ALA, 1967); Digest of Education Statistics, 1967, U.S. Office of Education; Bureau of the Census, Current Population Reports.

librarian. As the increased enrollment definitely leads to an increased need for library service, this seems to be a plausible result.

6. The state per-capita income is another variable which requires further analysis. Though the sign of the coefficient itself seems to be in agreement with the hypothesis that the greater the alternative opportunities the less the willingness of the librarians to stay in the field, the unreliability of the coefficient (e.g., at 95% level the estimate ranges between -.0009 and +.0019) precludes a definitive comment.

Since these coefficients are estimates based on the sample, it is inevitable that they are subject to sampling fluctuations. The extent of the fluctuation (or, the degree of heterogeneity among all the possible values of sample estimates) determines how reliable each estimate is. If our assumption of the normality of the distribution of the explained variable is valid, the group of all the possible least square estimates of the regression coefficient are themselves distributed normally. Thus, whatever the true value of the regression coefficient for each explanatory variable, 68% of all coefficients estimated from samples of size 39 take the values ranging between the true value (unknown) of the coefficient plus and minus one standard error. Approximately 95% take the values that are between the true value plus and minus 2 standard errors. Then it follows that an interval of 2 times the value of standard error centered around a given estimate of the regression coefficient has 68% probability that it contains the true value, and the interval of size 4 times the standard error centered around the estimate has about 95% probability that it traps the true regression coefficient. Thus, given a desired level of such a probability, the larger the standard error the larger the size of interval, hence the less the reliability of the estimate. The t-score given in the last column is the ratio of the estimated regression coefficient to its standard error.

Let us look again at the estimated regression coefficients in combination with respective standard errors and see what more we can say about our pre-notion regarding the role each explanatory variable plays in the variation of the explained variable:

1. $(E_p + E_{pp})_{60}$: This is the variable which purportedly represents the total number of the professional librarians potentially available for employment, and our pre-notion is that the actual level of employment of academic librarians depends proportionately on the size of this group. If such a prenotion is wrong and there is no relationship at all

between this variable and E_{p61}, the explained variable, the implied value of the true regression coefficient (β_1) is zero. Nevertheless, due to the sampling fluctuation, a given estimate (such as our .00034) can take a value other than zero. The question is whether such a value is so different from zero that the idea of $\beta_1 = 0$ is unlikely hence making us inclined to believe that the true regression coefficient is some value other than zero. Under a normal curve the point that is .84 standard deviations away from the mean divides the area under the curve into 80/20 proportions with the twenty percent portion at the extreme end. If one were willing to admit that the occurrence of an event taking place twenty times out of one hundred is unlikely, the occurrence of a value observed of one randomly selected sample being (M + .84) or greater must be considered rather unlikely. The standard error of the estimate of β_1 is .00033. Since β_1 is .00034, we cannot reject the hypothesis that the average number of professional librarians employed in academic libraries does not change directly with a change in the stock of librarians at a five or ten percent level of significance. We can reject the hypothesis that the true β_1 is 0 only at a twenty percent level of significance. Hence we conclude that this variable seems weakly related to the explained variable with a correct sign. However, since the estimated value is .00034, we would doubt that the true β_1 is 0. Thus, we reject the hypothesis that the average number of professional librarians employed by academic libraries does not change directly with the change in the stock of qualified librarians potentially available for employment. However, we must recognize that if the level of significance is revised to, say, ten percent, we will not reject the hypothesis that the true β_1 is zero. On this basis we would conclude that this variable seems weakly related with the explained variable with a correct sign.

2. E_{Np61}: The extremely small standard error compared to the value of the estimated β_2 indicates that quite possibly there is a relationship between the use of professionals and non-professional librarians in an academic library. That is, the sign of the estimated coefficient is positive and its value is almost as large as four times the standard errors which would be indeed a rare (fewer than one out of 1000) occurrence if the true β_2 were zero.

3. P_{p61} and P_{Np61}: A definitive statement about the value of the sign of either β_3 or β_4 cannot be made on the basis of our results. This is due to the large standard errors for both of the estimated coefficients. The ratio of the estimated β_3 to its standard error (t) equals .0710, indicating that such a value of the estimated coefficient (i.e. -.0000398) is likely to occur if the true β_3 is zero. Thus on the basis of

this analysis, we suspect that the behavior of the employment of professional librarians cannot be explained by the price (of the services) variable. Provided that the large standard error is not due to the presence of intercorrelations among the explanatory variables, the possible reason for this apparent insensitivity of the explained variable may be, on one hand, the institutionally or legislatively determined salary level for the librarians for each state that is fixed regardless of the amount of the services of the professional librarians needed and,on the other hand, occupational immobility of professional librarians, which may be attributed to the dominance of female labor and their devotion to their occupation.

We can reject the hypothesis that the true β_4 is 0 only at the .25 level of significance. Thus, we are not sure that the higher salary requirement of non-professional assistants the greater is the incentive to hire professional librarians. Since the hypothesis cannot be rejected at the .20 level of significance or less, the findings are inconclusive.

4. C_{61}: With the estimated regression coefficient being almost five times as great as its standard error (t=4.8654) the average college enrollment, as an indicator of the amount of the librarian services needed, explains best the variation in the average size of the professional librarians per academic library. This good fit of the linear form of regression suggests a rather rigid student-librarian proportion required for any size of library.

Although the cross-section analysis shows that average college enrollment is a good indicator of the need for academic librarians, in fact, the enrollment per professional staff has been rising over time (see Table 10). This rise in the ratio indicates that each academic librarian is serving a greater number of students. There are several reasons for the rising ratio: (1) the need for academic librarians may have outstripped the growth in the available supply, (2) the budgets may be frozen resulting in a horizontal demand, (3) productivity has risen due to rising capital expenditures, (4) there has been an increased use of non-professional librarians. The cross-section findings do, however, indicate the plausible path which the employment of academic librarians would take with the change in enrollment.

5. Y_{61}: The level of income, which was intended as an indicator of the extent of economic activities, hence the extent of alternative employment opportunities, does not appear to be important in explaining the variation in $E_{p.}$, the explained variable, in this regression. However, this variable is apparently not totally unimportant with respect to the employment of academic librarians (professional and/or non-professional). This is

Table 10

Librarian Employment -- Enrollment Ratios Academic Libraries

	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1966*
Personnel - FTE (thousands)	18.0	19.5	21.1	23.3	25.2	27.0	29.0
Professional (thousands)	9.0	9.7	10.3	11.2	11.9	12.5	13.0
Enrollments (millions)	3.4	3.6	3.9	4.3	4.8	5.3	5.9
Enrollment per prof. staff	378	372	378	388	401	402	454
Nonprof. staff (thousands)	9.0	9.8	10.8	12.1	13.3	14.5	16.0
Enrollment per nonprof. staff	340	368	361	366	361	366	369
Hours of student assistance (millions)	12.1	13.2	14.2	14.5	16.4	18.0	19.0
Student hours per enrollment	3.6	3.7	3.6	3.4	3.3	3.1	3.2

*Estimated

Source: Library Statistics, American Library Association, 1967.

evidenced in a separate experiment in which the logarithm of the ratio of E_{p61} to E_{Np61} was regressed linearly against the logarithm of: (a) P_{p61}/P_{Np61}, (b) Y_{61}, (c) C_{61}, and (d) (E_p+E_{pp61}).

The coefficient of multiple determination (R^2) was not very large, being .3427. But, the interesting result was a large negative (-.6850) value of the estimated regression coefficient with relatively small standard error (.03265) found for log 1/61. This estimated coefficient implies that, as the per-capita income rises by one percent, the proportion $\frac{E_p}{E_{Np}}$ falls by about seven-tenths of one percent. Since both the professional and non-professional librarians' employment would be expected to react to the change in income level in the same manner, it would seem that this result indicates that the employment of professional librarians is more sensitive to the change in income (hence the fall in $\frac{E_p}{E_{Np}}$). On the basis of this finding we would conclude that the employment of professional academic librarians is indeed inversely related with the change in income level. In view of the likely occupational immobility of the qualified librarians, as mentioned earlier, this phenomenon may be explained by the fact that the higher income level which is associated with a greater economic activity generates a greater and new demand for librarians such as from the corporations, hospitals, legal firms and the public libraries. The growth of libraries by type is given in Table 11.

Finally, the point must be stressed again that the preceding analysis is a simple experiment (with a severe data handicap) and whatever findings it provides are at best tentative. Thus, even with the limited data used in this regression, one can use an alternative approach that may yield a different result. Specifically it is possible that there may exist a correlation among the explanatory variables (e.g., income per capita and salaries) which results in unstable estimates. If this is the case, the use of step-wise multiple regression analysis, with a careful examination of the intercorrelations among the independent variables, would greatly improve the analysis.

What is important here is the pioneering attempt to use certain statistical techniques in the analysis of library employment. The conclusions of the cross-section study are meant to supplement the main analysis of the text. They are a starting point for future investigations.

Trends in Expenditures

The change in total expenditures by type of library are shown in Table 12, but the more interesting trends are to be seen in the components. Contrary to common opinion, both the salary and wage components of total expenditures of academic

Table 11: Number of Libraries

	1943-1944	1946-1947	1952-1953	1955-1956	1958-1959	1960-1961	1962-1963	1964-1965
TOTAL	11,380	11,334	12,478	12,852	13,676	13,019	14,240	21,344[4]
Public	7,995[3]	7,172	6,925	7,257	7,204	5,770	6,141	6,783
College & University	1,178	1,547[1]	1,374	1,432	1,450	1,379	1,442	1,810
Special	558	518	1,923	2,015	2,384	3,473	3,948	4,011
Law	312[2]	253	293	352	388	434	456	444
Medical	204[2]	163	393	425	667	755	973	1,045
Government	223	193	309	298	343			
Junior College	435			516		645	721	858
Armed Services			651	494	613	462	485	495

Note: Parts do not add to total since not all types of libraries are shown in table.

[1] Includes junior colleges

[2] Omits medical and law libraries in universities

[3] Omits branches and certain libraries with income of less than $500

[4] Cannot be compared with previous years because of definitional changes

Source: American Library Directory

Table 12

TOTAL EXPENDITURES BY TYPE OF LIBRARY (Millions)

Type of Library	1956	1959	1961	1963	1964	Percent Change
Academic	$ 90.6	112.6	154.6	207.7	287.7	217
Public	$208.9	298.3	344.8	417.2	532.2	155
Public School[2]	$ 20.0	24.3	41.0	69.5	93.3	367
Special	$ 62.2[1]			70.0	75.3	21

[1] These statistics for special libraries appear to be grossly understated (see The Bowker Annual, 1967, p. 39.).

[2] Expenditures for books only since total expenditures of libraries are a part of total expenditures of schools.

Source: The Bowker Annual, 1967, p. 5.

Table 13

Expenditure--Enrollment Ratios
Academic Libraries
1959-60 - 1964-65

	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1965-1966*
Number of libraries	1,951	1,975	1,985	2,075	2,140	2,168	2,207
Expenditures (millions)	$137.2	158.9	183.7	213.0	246.0	275.0	320.0
Number of students served (millions)	3.4	3.6	3.9	4.3	4.8	5.3	5.9
Number of volumes added (millions)	8.4	9.4	10.9	12.3	13.6	14.0	18.0
Volumes added per student	2.5	2.6	2.8	2.8	2.8	2.6	3.0
Expenditures per student	$ 40.34	44.02	47.13	50.95	51.25	51.89	54.23
Salaries (millions)	$ 72.5	83.8	95.9	113.0	126.0	138.0	155.0
Salaries as percent of operating expenditures	52.8	52.7	52.2	53.1	51.2	50.2	49.0
Wages (millions)	$ 11.7	13.9	15.5	17.0	19.0	21.0	23.5
Wages as percent of operating expenditures	8.5	8.7	8.4	8.0	7.7	7.6	7.3
Books and other materials (millions)	$ 40.8	48.3	56.4	65.0	79.0	91.0	111.0
As percent of operating expenditures	29.7	30.4	30.7	30.5	32.1	33.1	34.7

*Estimated
Source: Library Statistics, American Library Association, 1967.

libraries are falling, while the book share is rising.[27] (Table 13) According to Reichard and Orsagh, "The size of faculty was the overwhelmingly important variable associated with both the size of collection and the level of expenditures of these (academic) libraries."[28] Surprisingly, they found a negative correlation between the size of undergraduate enrollment and these two variables, but their finding is not conclusive, because of the large standard errors (due to the presence of multicollinearity between the independent variables).

Expenditures for books and materials in academic libraries will increase more rapidly as more Federal money becomes available. In fiscal year 1966, over 1,800 Federal grants were awarded to academic libraries for the purchases of library materials totaling $8.2 million.[29] It is significant that the increase in expenditures for these purchases for the period 1960-1966 averaged just over $11 million per year. Thus, the Federal grants will probably comprise a significant portion of future additions to books and materials. It is also possible too that the Federal government will disturb the ratio of public and non-public holdings of academic libraries. At the present time, public universities have approximately twice as many students as private universities, but public universities have only nineteen percent more volumes.

The expenditure trends of public libraries are reversing themselves. Until 1960 the percent of expenditures going into books and periodicals was falling and the percent spent on salaries was rising, but these are changing now (Table 14). We cannot make similar comparisons between public school libraries and public and academic libraries because most expenditures of school libraries are concealed in the totals for the schools. However, book expenditures per pupil in public schools rose considerably between 1954 and 1963 (Table 15), and these are projected to increase from $2.28 per pupil in 1963 to $4.42 in 1975.

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[27] The reader should recognize that some academic library statistics are suspect. Some libraries include microtexts, others do not; some estimate holdings, others do not. See Eli Oboler, "The Accuracy of Federal Academic Library Statistics," College and Research Libraries, XXV (November,1964), 494-496.

[28] Edwin W. Reichard and Thomas J. Orsagh, "Holdings and Expenditures of U.S. Academic Libraries: An Evaluative Technique," College and Research Libraries, XXVII (1966), 482.

[29] Theodore Samore, Library Statistics of Colleges and Universities, 1963-64, U. S. Office of Education, OE-15031-64, 1968, p. 4.

Table 14

Expenditure -- Population Ratios - Public Libraries

	1939	1945	1950	1956	1960[1]	1962[1]	1965[1]
Number of libraries reporting	5,798	6,026	6,028	6,249	823[2]	860[2]	1,114
Population served (millions)	79.1	89.9	115.0	117.6	112.6	118.1	128.0
Total expenditures (millions)	$48.8	61.8	109.8	170.2	199.2	252.9	344.6
Expenditure per persons served	$.62	.69	.95	1.45	1.77	2.14	2.69
Volumes added (millions)	7.1	6.9	9.3	11.5		12.9	16.2
Percent of expenditures for library staff	55.0	58.8	59.6	61.0	67.7	65.2	65.5
Percent of expenditures for books and periodicals	18.0	16.9	15.6	15.3	13.7	14.0	16.2
Percent of expenditures for capital	5.5	1.9	4.0		17.6	7.5	

Sources: The Bowker Annual, 1960, p. 5; Statistics of Public Libraries, 1962. Part I, U.S. Office of Education, OE 15051, 1965. (All data based on USOE surveys.)

[1] Libraries serving about 35,000 persons.

[2] Only 4 libraries did not report (1.4 percent of universe).

The allocation of Federal funds to public schools for book acquisitions is a key factor in the growth of school expenditures. Title II of the Elementary and Secondary Education Act of 1965 (ESEA) authorizes expenditures for printed and published and audio-visual materials. Title III, dealing with supplementary educational centers, permits the acquisition of library materials, and many anti-poverty projects in Title I, which gives assistance to educationally-deprived children, contains provisions for book expenditures. In addition, Title III of the National Defense Education Act makes grants of money for institutional assistance. Total Federal expenditures authorized for printed and audiovisual materials under these four titles were $207.0 million in fiscal year 1967, $218.0 million in fiscal year 1968, and $137.2 million in fiscal year 1969. One can see from Table 15 that Federal allocations are a significant percentage of total book expenditures in the public schools.

Robert J. Havlik estimates that expenditures for special libraries in the United States exceed $189 million and the 171 million bound volumes in these libraries exceeds the totals of all other types except academic libraries.[30] Expenditures of the Federal government constitute a large share of the total for special libraries. The Bureau of the Budget Survey of Federal expenditures for library services for fiscal year 1963 showed a total of $88,273,400, and this figure did not include several post libraries.[31]

The expenditures of the 437 special libraries serving the Federal government that were surveyed in fiscal year 1965 are given in Table 16. Of the total expenditures of over $58 million seventy percent were for salaries and nearly nine percent for library materials. It should be pointed out, however, that nearly fifty-eight percent of the total expenditures were in the three national libraries.

The above statistics point out why the average cost of library services generally are expected to rise

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[30] Bowker Annual, 1967, p. 39

[31] The BOB survey had a universe of over 1,500 libraries. The request for information from these libraries is found in U. S. Bureau of the Budget Bulletin No. 64-13, May 12, 1964. According to Mr. Paul Howard, Executive Secretary of the Federal Library Committee, the 1964 survey was not complete. He estimates that the total expenditure by the Federal government in the 1500 libraries is in excess of $150 million.

Table 15

Expenditure -- Enrollment Ratios - Public School Libraries
1953-54 - 1962-63 and Projected to 1974-75

	Actual				Projected				
	1953-1954	1958-1959	1960-1961	1962-1963	1963-1964	1965-1966	1967-1968	1969-1970	1974-1975
Number of school systems	7,198	15,526	14,830	15,564					
Number of schools (thousands)	128.8	82.2	102.5	83.4					
Schools with centralized libraries (thousands)	46.9	41.5	47.5	49.2					
Total enrollment (millions)	27.7	33.7	36.0	37.3	40.2	41.7	43.2	44.5	47.1
Enrollment in schools with libraries (millions)	16.3	23.0	25.3	27.7	28.7	29.8	30.9	31.8	33.6
Percent of schools with libraries	36.0	50.0	46.0	59.0					
Number of volumes in schools (millions)	73.0	123.2	143.5	171.6	185.0	208.7	233.6	258.5	320.9
Volumes per pupil	4.5	5.3	5.7	6.2	6.4	7.0	7.6	8.1	9.5
Book expenditures	$16.1	36.9		63.2	71.5	84.6	98.5	112.5	148.6
Book expenditures per pupil	$.98	1.60		2.28	2.49	2.84	3.19	3.54	4.42

Source: The Bowker Annual, 1967, p. 59.

Table 16

Selected Data on Resources, Expenditures and Staffing of Special Federal Libraries by Region*

Item	Total	Washington Metropolitan Area	U. S., excluding Washington Metropolitan Area
Resources			
Volumes	33,742,315	23,769,796	9,972,519
Serial titles	312,775	227,567	85,208
Government documents and technical reports	14,311,647	9,042,298	5,269,349
Microform	4,735,450	1,390,235	3,345,215
Maps	4,759,494	4,030,443	729,051
Expenditures			
Total operating expenses	$58,187,838	$44,365,464	$13,822,374
Salaries	$39,396,795	$31,151,414	$ 8,245,381
Library materials	$ 9,049,928	$ 5,359,043	$ 3,690,885
Binding and rebinding	$ 1,026,480	$ 746,495	$ 279,985
Other expenses	$ 8,701,635	$ 7,101,512	$ 1,600,123
Staff**			
Total positions	3,884	2,865	1,019
GS 5 and below	687	378	309
GS 6-9	1,775	1,303	472
GS 10-13	1,226	993	233
GS 14 and above	196	191	5

*These figures include only the 96 VA libraries responding directly to the survey.

**Does not include non-professional personnel in Library of Congress.

Source: Survey of Special Libraries Serving the Federal Government p. 4

in the foreseeable future. Two-fifths to three fourths of all library costs consist of salaries. Library salaries will probably rise as wages rise generally in society. However, salary increases in non-library occupations are often traceable to increases in higher productivity, but in the library field there is no guarantee nor little possibility that productivity will increase. If productivity does increase it will probably increase less than in American industry. Thus as library salaries rise and productivity does not keep up, average costs of library services will continue to rise.

Many chief librarians are looking to technological improvements to reduce costs or to hold them in line. Technology offers the opportunity of providing services and of improving the organization and management of libraries. In addition to the use of the new information technology, library costs may be reduced through inter-library cooperation and the establishment of inter-library networks.

The inter-state compact is one approach to improving library service and reducing costs. At present only Iowa and Illinois contract for local public library service under inter-state library compact authority, but they hope that eventually the area of Missouri which borders Keokuk, Iowa will also become part of this Koesippi compact.[32] This agreement became effective on July 1, 1965, and it provides public library service to an area within a 50-mile radium in Iowa and across state lines in Illinois. All costs are shared by Iowa and Illinois. The inter-state compact is an excellent vehicle for providing library services in areas where the amount of population may not justify a large financial investment in a library facility or book collection. It may be much more economical for a state to share the costs. The compact has special application for research libraries and where extensive automated equipment is involved.

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[32] Michelle R. Vale, "The Interstate Library Compact," Library Journal, XCI (May 15, 1966), 2419. Other states have various cooperative arrangements, but according to Miss Vale these are not as complete now (in 1969) as the Iowa, Illinois compact.

The Nassau Library System is an example of library sharing at the county level. When it was organized in 1959, it was hoped that its major contribution would be to reduce certain fixed costs (such as book processing and cataloging), to enhance certain services (such as reference and inter-library loans), and to provide consultative services which are not generally available at small libraries. When the system was established, there were 32 independent public libraries cooperating in this venture. Since then 18 more libraries have joined.

The potential for these cooperative arrangements is seen in some of the statistical results. Although the Nassau system was not able to reduce the salary component of total expenditures (it was 65 percent of the total in 1966 and 73 percent in 1967), the system was able to serve over 473,000 persons at an average cost of $1.60 per person in 1966. This cost compares with an average of $2.69 per person in all public libraries serving 35,000 persons or more in 1965, the latest national data available. The library materials added in 1967-68, represented only 6 percent of the total budget and this may be compared with the 20 percent figure for the Nassau County Public Libraries. Moreover, the Nassau Library System had a $900,999 surplus in this operating year.[33] These financial gains were achieved without sacrificing the quality of service. In nearly all areas of service the Nassau System compares favorably with the surrounding libraries.

The great variation in the quality of library service provided to Americans demands that new approaches be used to improve the services in areas where it is either non-existent or poorly offered. It is estimated that approximately 20 million Americans (chiefly in rural areas) have no library services and that another 10 million have access only to meager resources of inadequate collections. A related problem is that many libraries are called on to render services to residents of areas that do not support these libraries financially.

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[33] These data are taken from Budget Statistics and Salary Schedules, 1967-1968, compiled by Nassau County Library Association.

This situation calls for additional kinds of coordination. These requirements point to the need to develop networks of libraries and library sub-systems that can provide for the transfer of messages and materials between library systems. One group of analysts claimed that "It appears very unlikely that the operational requirements implied by the foregoing desiderata can be met by the techniques in current use. More extensive application of advanced technology will certainly be required."[34]

Salary Comparisons

The average starting salary of any profession is a key determinant of supply. Table 17 suggests that librarians start at lower salaries then most other professionals and if we compare salaries for master's degree holders only, the discrepancy is much wider. The average annual beginning salary for those with a master's degree ranged from $6,864-8,100 in 1962 to $9,576-10,416 in 1967 -- considerably more than librarians, about one-third of whom hold the advanced degree. The low starting librarian salaries may be explained by the dominance of women, who often receive a second income and who have high turnover, less mobility and fewer employment alternatives for the BSLS degree holders.[35]

Table 18, showing starting salaries for librarians and other professionals for 1966 and 1967, tends to bear out the lower starting salaries of librarians compared to other professionals, but it points also to the lower salaries of occupations that are dominated by women. Of the occupations shown, only home economics in the Federal government (with master's degrees) had higher starting salaries than librarians in 1967, but professional occupations dominated by men had overall higher salaries.

Librarians' and other professionals' average salaries are compared in Table 19. Although library salary data are scarce, some comparisons can be made.

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[34] Technology and Libraries, p. 27.

[35] One factor complicates the comparison, however, since the library data of Table 17 refer to annual, full-time salaries, regardless of vacation period. Thus, in some cases, the figures compare 11-12 and 9-10 month salaries.

Table 17

Average Starting Salaries
Librarians and Other Professionals Compared

Year	Librarians[1]	Male Engineers	Male Accountants	Women with Bachelor's Degrees		
				Chemistry	Accountants	Engineering Research
1951	$3,000 - 3,300	$3,240	$2,952			
1952	3,350 - 3,400	3,660	3,300			
1953	3,575 - 3,625	3,900	3,564			
1954	3,650 - 3,700	4,260	3,900			
1955	3,900	4,452	4,068			
1956	4,190	4,980	4,464			
1957	4,450	5,448	4,824			
1958	4,683	5,664	5,004			
1959	4,862	5,868	5,196			

Table 17 -- Continued

Year	Librarians[1]	Male Engineers	Male Accountants	Women with Bachelor's Degrees		
				Chemistry	Accountants	Engineering Research
1960	5,083	6,120	5,352			
1961	5,365	6,348	5,544			
1962	5,661	6,648	5,856			
1963	5,902	7,140	6,288			
1964	6,145	7,356	6,444	6,468	5,664	7,224
1965	6,468	7,584	6,732	7,056	6,768	7,260
1966	6,765	8,112	7,128	7,452	6,984	8,208
1967	7,305	8,772	7,776	8,280	7,716	8,904
Percent change: 1951/1967	132	171	167			

[1] First positions after graduation from accredited library school.

Source: Carlyle J. Frarey and Richard S. Rosenstein, "Placements and Salaries in 1967," Library Journal, XCIII (June 15, 1968), 2444-2449, and prior annual surveys; Frank S. Endicott, Trends in Employment of College and University Graduates in Business and Industry (Northwestern University, annually); Occupational Outlook Handbook, 1968-69, U.S. Department of Labor, Bulletin No. 1550, 1968.

Table 18

Starting Salaries for Selected Occupations

Occupation	Salary	Date of Last Survey
Occupations Employing a High Percentage of Women		
Librarian	7,305	1967
Home Economist with master's degree - Federal Government	7,696	1967
Recreation Workers	6,750	1967
Social Case Workers in Urban Areas	5,800	1967
Social Workers - Federal Government	6,451	1967
Public Elementary Teachers	6,609	1967
Other Professional Occupations		
New College Graduates	7,500	1967
Personnel Workers	7,100	1966
School Counselors	8,000	1966
Engineers	8,300	1967
Mathematicians	7,300	1966
Chemists	7,500	1966

Source: Occupational Outlook Handbook, 1968-69, U.S. Department of Labor, Bulletin No. 1550, 1968.

Table 19: Average Salaries, Librarians and Other Professionals Compared

	1959	1960	1961	1962	1963	1964	1965	1966	1967
					Librarians				
Public school			$5520						6708*
Public			$5625*				6670		
Academic	$6901*			8768					9694- 8425
Special	$6099								9620
					Other Professionals				
Public school Instructional staff	$4939	5174	5449	5700	5921	6240	6465	6786	7129
Teachers, Public Junior colleges		$6578		7212		7828		8361	
Chemists		$8164	9300	9804	10212	10608	11024	11535	12399
Engineers		$9100	9792	10152	10680	11184	11575	12022	12717
					Cost of Living				
Per-capita disposable income	$1905	1937	1983	2064	2136	2280	2427	2584	2735
Consumer price index 1957-59 = 100	101.5	103.1	104.2	105.4	106.7	108.1	109.9	113.1	116.3

*Median salary

Sources: See sources to Tables 3, 9, 10, 22, 14, and Statistics of Public School Libraries, 1960-61, OE-15049, 1964; Economic Status of of the Teaching Profession, 1967-68, National Education Association, Research Report 1968-R4; 23rd Biennial Salary Survey of Public School Professional Personnel, 1966-67, Research report 1967-R11 (Washington, D.C.: National Education Association, 1967), p. 22. The 1965 public library figures are unpublished data of the U. S. Office of Education: Anita Schiller, Characteristics of Professional Personnel in College and University Libraries, U. S. Office of Education, May, 1968.

Not only do librarians start at lower salaries than other professionals of equal education, but their average salaries tend to be lower. A U.S. Department of Labor survey indicated how librarian salaries lag behind those of women in other occupational groups. From Table 20 we learn that only secretarial and clerical workers had lower salaries seven years after attaining a bachelor's degree.[36] In a ranking of the earnings of 321 selected occupations in the United States, male librarians were in 219th place.[37] Women librarians would have ranked considerably lower.

Within the library field, academic and special library salaries tend to be higher than those of public or school librarians (Table 19). The $6,708 median salary for school librarians would be $400-500 lower than the mean salary, and if the trend rate of growth for public librarians continued to 1967, their mean salaries would be approximately $7,000. It should be noted, however, that public, academic and special librarians usually work 11-12 months, while school librarians are employed for 9-10 months. Thus it can be stated with relative certainty that public librarians are the lowest paid group. If the conditions that Alice Bryan found in the late 1940's still hold, then the low salaries of public librarians are explained by their individual qualifications. She found that three-fifths of all public librarians did not meet the minimum professional standards and two-fifths did not hold an undergraduate degree.[38]

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[36] College Women Seven Years After Graduation, U.S. Department of Labor, Bulletin No. 292, 1966.

[37] Max A. Rutzick, "A Ranking of U.S. Occupations by Earnings," Monthly Labor Review, LXXXVIII (March, 1965), p. 252.

[38] Alice I. Bryan, The Public Librarian (New York: Columbia University Press, 1952), p. 437.

Table 20

Average Annual Salary in 1964 of Women Who Graduated in 1957

Occupation	Salary
All graduates	$5,947
Librarians	5,658
Chemists, mathematicians, statisticians	8,039
Clerical	4,813
Dieticians and home economists	6,110
Editors, copywriters, reporters	6,274
Managers, officials	7,466
Nurses	6,078
Professional workers (misc.)	6,490
School workers (misc.)	6,744
Secretaries, stenographers	4,527
Social, welfare, recreational workers	6,137
Teachers	5,890
Technicians (biological)	5,843

Source: College Women Seven Years After Graduation, U.S. Department of Labor, Bulletin No. 292, 1966, p. 54.

The comparison of salaries of academic and special librarians has been complicated by the publication of the Schiller study of academic librarians. Her average salary of $8,425 is considerably lower than the $9,694 figure we computed from the salaries reported by 395 institutions, which is much closer to the figures shown in the 1968 Bowker Annual.[39] She claims that academic librarian salaries are higher than public or school librarians but lower than special librarians.[40] This comparison appears to hinge, however, on whether the salaries of directors of academic libraries are included. Their salaries are much higher than other professionals in these libraries. (See Table 21.)

Whether academic or special librarians receive the highest salary may not be known for certain, but it is clear that these two groups may be considered the elite of the profession. The Occupational Outlook Handbook agrees with this assessment. It states, "The highest paying positions are found in school, college and special libraries rather than in public libraries. Librarians who have an advanced degree in any field and teaching or administrative experience will find best salaries in academic or special libraries."[41] The latest salary survey is given in Table 22. If academic librarian salaries are lower than those of special librarians, this fact may not be true for long. The increase in average starting salary for persons who graduated from an accredited library school who were employed in academic libraries rose by $865 to $7,693 in 1967 and this compares with a $34 increase in average salaries for new special librarians with the same qualifications.[42]

Some of the findings of the Schiller study are worth noting here. She found the mean salary of men in

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[39] Page 323. The sources of the other salaries are given in Table 19.

[40] Schiller, Characteristics of Professional Personnel in College and University Libraries, p. 22.

[41] Occupational Outlook Handbook, p. 216.

[42] Carlyle J. Frarey and Richard S. Rosenstein, "Placements and Salaries in 1967," Library Journal, XCIII (June 15, 1968), p. 2447.

Table 21

Average Salaries
Directors of Academic Libraries
(11-12 months)

	1958-1959[1]	Sept. 1 1962[2]	Sept. 1 1964[2]	Sept. 1 1967[2]
Public				
University Library	$10,100	$13,045	$14,218	$19,235
Liberal Arts	7,500	9,625	8,666	13,837[3]
Teachers College	6,730	8,940	8,712	10,951[4]
Junior College	6,600	7,435	7,135	11,630
Private				
University Library	9,800	11,147	13,000	15,235
Liberal Arts	5,680	7,204	6,591	11,520[3]
Teachers College	4,700	7,121	N.A.	10,379[4]
Junior College	4,100	5,629	5,018	7,642

Note: The mean salary statistics shown in the U.S. Office of Education publication, OE 15031-62 are in obvious error, since they show a declining absolute salary trend. According to OE officials, they resulted from poor sampling techniques that stemmed from an attempt to avoid disclosing identity of schools (at their request). The average error is about 25 percent.

[1] Median salaries

[2] Mean salaries

[3] Classification changed to 4-year institution with graduate program.

[4] Classification changed to 4-year institution without grad. program.

Sources: The Bowker Annual, 1960, p. 24; Library Statistics of Colleges and Universities, 1961-62, U.S. Office of Education, OE 15031-62, 1964; Library Statistics of Colleges and Universities, 1963-64, U.S. Office of Education, OE 15031-64, 1968; Library Statistics, 1966-67.

Table 22

Special Libraries
Average Salaries

	Salaries, 1967		Salaries, 1959*	
	Number	Percent	Number	Percent
$6,499 and under	410	10.6	1,601	73.4
6,500 - 6,999	241	6.2		
7,000 - 7,499	305	7.9	270	12.4
7,500 - 7,999	322	8.3		
8,000 - 8,499	360	9.3	145	6.7
8,500 - 8,999	279	7.2		
9,000 - 9,499	313	8.1	76	3.5
9,500 - 9,999	270	7.0		
10,000 - 10,999	446	11.5	44	2.0
11,000 - 11,999	268	7.0	16	.7
12,000 - 12,999	239	6.2	17	.8
13,000 - 13,999	119	3.1		
14,000 - 15,999	135	3.5	11	.5
16,000 - 17,999	79	2.0		
18,000 - 19,999	38	1.0		
20,000 and over	43	1.1		
Total	3,867		2,180	
Mean	$9,620		$6,099	
Median	9,025		5,820	

*Included manufacturing, nonmanufacturing, and nonprofit only.

Source: "A Study of 1967 Annual Salaries of Members of the Special Library Association," Special Libraries, LVII (April, 1968), 220.

academic libraries to be $9,598 and for women $7,746, and the gap between the two widened with experience. For example, women with 25 years experience were earning approximately $9,000, while men with 20 years experience had median salaries of $12,570.[43] She also found that the library science doctorate is highly rewarded -- the median salary equalled $15,600 for these degree holders. This may be compared with the $14,000 median for economists -- one of the highest groups surveyed by the National Science Foundation.[44] Another Schiller finding which is reported without comment, is that median salaries of professional librarians in two-year institutions are the highest of all. The $8,320 median for this category may be compared with the $8,020 figure for universities and $8,280 for teachers colleges.

The salary structure in the Federal government is unlike that of any other group of libraries. The analysis of staff positions is given in Table 16. The average salary of $10,144 for all Federal librarians in 1965 is higher than that of any other group. This average is deceiving, however, because the average salary of all Federal librarians outside of the metropolitan Washington area is only $8,091. Moreover, the salaries are extremely skewed. Ninety percent of the GS-14 and 15 positions were in the national libraries and there were only 5 GS-14 and above grades to be found outside of the Washington area. The modal rank outside of Washington was GS-6-9 and this probably explains the great difficulty the Federal government has been having in staffing the libraries outside of Washington. Not only are the salaries skewed, but the salaries do not reflect the work load. For example, region 2 receives 29 percent of the total outlays, 41 percent for library materials, but only 20 percent for salaries.[45]

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[43] Schiller, p. 86.

[44] See Summary of American Science Manpower, 1966, National Science Foundation, 1968, p. 1.

[45] See Frank Schick and Paul Howard, Survey of Special Libraries Serving the Federal Government, U.S. Office of Education, OE-15067, 1968.

Manpower Supply

The main source of supply of librarians is the schools of library science. The number of earned degrees has nearly tripled since 1960 and the percentage of library science degrees to all degrees has risen from a low of .42 percent in 1959 to .70 percent in 1968 (Table 23). These statistics indicate that the schools are responding to the additional demand for library education, which in turn is influenced by the trend of wages, tastes and prestige. Since 1950, the bulk of the library school programs have been converted to the master's level. This degree has become the most important as the profession has been upgraded and as the quality of graduate programs has been strengthened. Administrative leaders in the states and the schools have established the master's degree as the criterion of professionalism, but most school and public librarians do not possess this degree. Moreover, about one-third of the total master's degrees are awarded by non-accredited schools.

It is difficult to ascertain whether the library schools are responding to manpower needs. The rise in the number of library personnel (Table 2) suggests that such may be the case, but if budgetary constraints create a horizontal demand situation, then the increase in the number of employed means either a shift to the right of the supply schedule or a movement along the schedule.[46]

Table 24 gives the details of placements of new graduates of 5-year library programs. The most significant change is in the college and university component: an increased share from the low of from 27-28 percent. All other types of library have shown no change or a small percentage decline since 1956. Given the salary

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[46] A supply schedule for librarians shows the number who will offer their services at a given salary at a point in time. The supply curve slopes upward to the right. If library schools are responding to manpower needs, the curve should move to the right, indicating that more persons are willing to work at each salary level. An increase in employment by itself does not indicate a shift of the curve.

Table 23 Earned Degrees, Library Science 1952-53 - 1967-68

	1952-1953	1953-1954	1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967	1967-1968
All degrees (thousands)	374.2	358.7	354.4	379.5	411.1	440.3	464.0	479.2	490.6	517.0	554.8	617.7	667.6	679.6	740.8	828.7
Library Science degrees	1645	1730	1827	1780	1749	1866	1967	2262	2371	2567	2827	3375	3846	4577	5390	6106
Percent of library to all degrees	.44	.48	.52	.47	.43	.42	.42	.47	.48	.50	.50	.55	.58	.70	.70	.70
Library Science degrees--Bachelor's and first level •	607	1596	1536	1592	1542	1690	1756	1938	384	419	454	568	623	642		
Five-year programs Masters or second level	1035	127	287	173	198	157	205	305	1973*	2138	2356	2779	3211	3916		
Doctorates	3	7	4	10	9	19	6	19	14	10	17	14	12	19		

*After 1960 Five - year programs were converted to master's level

Sources: The Bowker Annual, 1960, 1962, 1964, 1968
The 1965-66 data are from an Office of Education Survey

Table 24 Placements of New Graduates, Five-Year programs

	1951-1955	%	1956	%	1957	%	1958	%	1959	%	1960	%	1961	%	1962	%	1963	%	1964	%	1965	%	1966	%	1967	%
Public:	2076	33	355	32	415	33	348	31	419	31	520	34	474	31	521	32	547	29	588	29	746	29	830	29	904	28
Municipal			307		362		314		342		424		387		438		447		504							
County			48		53		34		77		96		87		83		100		84							
School	1424	23	232	21	254	20	226	20	280	21	295	20	326	21	362	22	371	20	418	21	502	19	631	22	686	21
College and University	1774	28	298	27	381	30	345	30	418	31	436	29	478	31	491	30	631	34	657	32	910	35	927	32	1180	37
Special	1000	16	202	19	204	16	214	19	230	17	255	17	259	17	261	16	290	16	362	18	428	17	477	17	456	14
TOTAL	6274		1087		1254		1133		1347		1506		1537		1635		1839		2025		2586		2865		3226	

Note: The "Special and Other Placements" category was renamed "Other Library Agencies" in 1966-67.

Source: Based on Annual Survey appearing in Library Journal, June 1, 1953. See source to Table 17 for latest survey.

trends of the previous section, the greater potential for research and a favorable job environment, the university gain is no accident. It reflects an economic reality.

The number of doctorates in a field is a good indication of the ability of that field to increase its supply, since these are the source of university faculty from whence this increased supply must come. By this standard, the library field is faring poorly; only 163 doctorates were awarded between 1953 and 1966. But the Federal government is bidding to increase the number of persons in the nation's libraries and information centers under Title IIB of the Higher Education Act of 1965. In academic year 1968-69, 500 fellowships for graduate training will be provided, 168 at the doctoral level. This number is approximately two-thirds of the total enrollment for doctoral studies in all library schools. While some fellowships are carry-overs from 1967-68, these awards will undoubtedly increase the supply of teachers and/or librarians in coming years.

Another facet of library supply has received little attention: the number of programs of library science in junior colleges has grown at an astounding rate. In October 1965, John Martinson was able to identify 24 pre-professional and technical programs in junior colleges.[47] Two years later, I was able to count 117 programs, of which 97 were transfer type (Table 25). Several relevant questions need to be asked at this point. Where are the graduates of the 10 schools offering terminal (occupational) programs? Where are the persons who are transfering to "regular" programs in the universities? How many are graduating? Samuel Sass has already raised serious issues about the quality of technician programs in junior colleges,[48]

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[47] "Vocational Training for Library Technicians," U.S. Office of Education Contract OE-5-85030, October, 1965.

[48] Samuel Sass, "Library Technicians--Instant Librarians," Library Journal, XCII (June 1, 1967), 2122-2126.

Table 25

Library Science Programs
Junior Colleges
By States

California	29	Illinois	5	Massachusetts	1
Texas	20	Missouri	5	North Carolina	1
Kansas	7	Iowa	4	Ohio	1
Michigan	7	Georgia	3	Oregon	1
Minnesota	7	Oklahoma	2	South Carolina	1
Mississippi	7	Idaho	1	Utah	1
Florida	6	Kentucky	1		
Washington	6	Maryland	1		
				Total	117

Library Science Programs
Junior Colleges
By Type

Occupational	(o)	10
Transfer	(t)	97
Comprehensive	(c)	9
No category		1
	Total	117

Source: Directory of American Junior Colleges, Appendix III, 7th ed., American Council on Education, 1967.

but the key issue is that most catalogues of these colleges state that "you will be able to go on towards a professional degree." An Ad Hoc committee of the ALA recommended in 1966 that standards be set up for 2-year colleges and as of March 1, 1968, there is a Junior College Library Information Center at ALA to consider these problems.

It may also be very significant that Xerox Corporation has announced a program to provide an entire junior college library for $18,220. This "Opening Day" book list contains more than 2,000 essential in-print and out-of-print books for the undergraduate library. The Opening Day Collection may be supplemented by an enrichment list of 4,700 titles.[49] The corporation claims that the collection "allows a library to meet all necessary accreditation standards." This ease of obtaining a total collection may have the effect of increasing the demand for librarians.

As Table 26 shows, librarianship has been a women's occupation (although the entrance of the male-dominated information scientist could change these percentages). The heavy reliance on women has created certain "manpower" problems in the library field. Among these are little mobility, low pay, increased use of part-time personnel, and high turn-over. These factors may act as disadvantages in recruiting men into the field, although they could have the opposite effect of inducing males to enter the library field because they feel they could get to the top more easily.

This situation is best seen in the statistics of Federal employment. Although women outnumbered men 2,382 to 929 in the Federal government in 1965, there were 27 men in the super grades (GS 15-18) to 2 women and not one woman held a top GS-18 position.[50]

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[49] College Library Program: A Comprehensive Book Service for the Academic Library (Ann Arbor, Mich.: University Microfilms).

[50] Bowker Annual, 1965, p. 26.

Table 26

Degrees in Library Science
By Sex
1952-53 - 1966-67

Year	Total, Degrees	Number, Men	Number, Women	Percent, Women
1952-53	1,645	363	1,282	78
1953-54	1,730	---	---	--
1954-55	1,827	---	---	--
1955-56	1,775	398	1,377	78
1956-57	1,749	420	1,329	76
1957-58	1,866	447	1,419	76
1958-59	1,967	485	1,482	75
1959-60	2,262	554	1,708	76
1960-61	2,371	566	1,805	76
1961-62	2,567	524	2,043	80
1962-63	2,827	666	2,161	76
1963-64	3,375	693	2,682	79
1964-65	3,846	847	2,999	78
1965-66	4,577	---	---	--
1966-67	5,390	980	4,366	81
1967-68	6,106	1,221	4,889	80

Source: Bowker Annual, 1963, 1965, 1968.

Library Manpower Requirements and Shortages

The literature of librarians is replete with examples of shortages of all types of personnel. The best single source of these shortages is the National Inventory of Library Needs published by ALA in 1965. Table 27 compiled from this Inventory, indicates that there was an estimated shortage of over 100,000 librarians and that it would have cost $646 million to fill the shortage in 1964. To this must be added the 18,000 shortage of special librarians calculated by ALA. These estimates of "persons needed" were obtained by comparing the actual levels of employment and the number that must be hired to meet ALA standards. This number was multiplied by $6,000 (the average salary) to obtain the "dollars to fill shortages."[51] According to figures supplied to the National Advisory Commission on Libraries by the U.S. Office of Education, it would require a lump sum expenditure in 1968 of 1.6 billion dollars to stock school libraries optimally.

To estimate manpower shortages, one must make projections of manpower needs. In the post World War II period, the Bureau of Labor Statistics predicted the future demand for engineers by calculating the ratio of all U. S. engineers to the total labor force and by extrapolating the ratio of engineers to the labor force in various industries. This method assumes a constant ratio of engineers and like many other estimates of its kind it grossly understated the actual growth of engineers.[52] The concept of need must be distinguished from that of demand. Need is often based on professional standards and expectations,

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[51] The following ALA Standards were used: Public Library Service: A Guide to Evaluation with Minimum Standards, 1956; Interim Standards for Small Public Libraries, 1962; Standards for College Libraries, 1959; Standards for Junior College Libraries, 1960; Standards for School Library Programs, 1960.

[52] See Blank and Stigler, The Demand and Supply of Scientific Personnel, p. 33.

Table 27

Estimated Shortages of Library Personnel, 1963-64 By Type of Library

Type of Library	Persons needed	Dollars to fill shortages
Public School	87,000	$522,000,000
Public	6,400	38,000,000
Academic	3,800	23,000,000
Non-public School	10,500	63,372,000
Total	107,700	$646,372,000

Source: National Inventory of Library Needs, ALA, 1965.

whereas demand is based on a description of what people are willing to pay for a particular service at a given point in time.

Job vacancy statistics are sometimes used to denote the extent of shortages. They are measures of shortage only if the vacancy is real. Vacancies are real only if funds are available and there is a difference between the quantity needed and the equilibrium amount determined by the market. Expressions of desire do not constitute economic demand. It is not enough to dream: if I only had another librarian (or technician, or maintenance man, or typist).

A digression is necessary at this point. Since librarianship is a highly human endeavor, it may now be a victim of the economic marketplace in the same sense that Baumol and Bowen found in the performing arts.[53] They found that the marketplace bids the prices of these services to levels that make it uneconomic for many to provide the service. Costs can be covered only by setting very high prices and only Broadway shows that have a good chance of success are funded.

As librarian salaries are pulled upward by the force of all professional salaries, it may become uneconomic to provide this service. Communities and schools that lack adequate libraries are priced out of the marketplace by rising costs. Hence, we may all agree that library services ought to be improved generally and that there are shortages of persons at the going salaries of the community, yet these salaries may be too low to attract persons to these employments. Under these conditions, the aspirational levels are quite difficult to attain. Libraries make do with less and the quality of library services improves little or not at all. Most of the analyses of this paper have been with demand in the economic sense and the conclusions are based on an analysis of existing supply and demand conditions. These conclusions in no way are to be taken as indicating a satisfaction with the current level of library services.

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[53] William J. Baumol and W. C. Bowen, Performing Arts: The Economic Dilemma (New York: Twentieth Century Fund, 1966).

Table 28 summarizes the existing vacancy data. Although the number of professional vacancies has risen, the rate has not. In 1961-62, there were 560 vacancies in academic libraries (5.2 percent of the total employed), but in 1963-64, the 632 vacancies were still 5.3 percent of the filled positions. The rate increased slightly to 5.8 percent in 1965-66. For public libraries, the comparable data were: 1960, 812 professional vacancies (7.0 percent); 1962, 965 vacancies (7.2 percent); and 1965, 1,015 vacancies (7.1 percent). Drennan estimates that the vacancy rate in large public libraries declined between 1962 and 1965.[54] The vacancy rates for non-professional is generally lower than for professionals -- usually about one-half the professional rate.

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[54] Henry T. Drennan, "Statistics of Public Libraries," Bowker Annual, 1968, p. 16.

Table 28

Unfilled Positions By Type of Library

	Date of Survey	Number of Unfilled Positions	Vacancy Rate
Academic	1961-62	560	5.2
	1963-64	632	5.3
	1965-66	794	5.8
Public	Fiscal year 1962	1,147	5.5
	" " 1962	965	7.2
	" " 1965	1,015*	7.1
School	1960-61	591	2.4**

*For libraries serving communities of at least 25,000 inhabitants.

**The fact that teachers or other adults may be assigned to school libraries probably accounts for this low rate.

Sources: Library Statistics of Colleges and Universities, 1963-64, OE-15031-64, 1968, p. 5-6; Henry T. Drennan and Sarah R. Reed, "Library Manpower," ALA Bulletin (September, 1967), 957-965; Statistics of Public School Libraries, 1960-61, OE-15049, 1964, p. 51.

V. CONCLUSIONS AND RECOMMENDATIONS ON LIBRARY SHORTAGES

The word "shortage" is used in many ways.

> In one sense, there is a shortage of members of a particular profession if the actual number is less than the number dictated by some social criterion or goal. For example, one might use the criterion that we should have enough engineers to conduct a major war in a particular manner, or that we should have ten per cent more engineers than a hostile power is believed to have. Such a criterion could be important and fully developed, but normally, it is left undefined in the literature. A second meaning of shortage is that the quantity of the labor services in question that is demanded is greater than the quantity supplied at the prevailing wage . . . . The third meaning of shortage . . . . is that a shortage exists when the number of workers available (the supply) increases less rapidly than the number demanded at the salaries paid in the recent past. Then salaries will rise, and activities which were performed by (say) engineers must now be performed by a class of workers who are less well trained and less expensive. Such a shortage is not necessarily objectionable from a social viewpoint, but this is a separate question.[55]

The above quotation shows that many persons fail to distinguish between library needs as established by ALA standards and needs as established in the marketplace. There may be no shortages of librarians based on prices that administrators are offering for their services at the same time that many persons are craving additional assistance in the libraries. The ALA shortages are unrelated to the number of librarians the society wishes and is able to hire at prevailing salary rates. The standards established by ALA are based on what it feels is necessary for adequate staffing of the nation's libraries. But shortages based on these standards are not usually what economists mean when they use the term "shortage." They are sympathetic to the concept of raising standards but they must be concerned chiefly with the world of the possible.[56]

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[55] D. M. Blank and George J. Stigler, The Demand and Supply of Scientific Personnel (New York: National Bureau of Economic Research, 1957), pp. 23-24.

Another facet of the confusion in the use of the term "shortage" is seen in the statement of the National Advisory Commission on Libraries that "all estimates of the number of professional personnel needed to fill existing vacancies and for normal attrition of staff for public, academic, and special libraries exceed the number of librarians graduated each year by the 42 accredited schools of librarianship in the United States and Canada. With respect to the provision of librarians qualified for positions in elementary and secondary school libraries the situation is even more unsatisfactory."[57]

According to the United States Office of Education, in January, 1968, there were about 380 librarian information programs in the United States in various stages of development. Since 1962, the 42 accredited schools have graduated approximately 60 percent of all persons obtaining library science degrees and the remaining schools account for the other 40 percent. The National Advisory Commission on Libraries and many other professionals in the library field continue to act as if the non-accredited schools do not exist, but the marketplace knows of their existence. The number of non-accredited schools has doubled in the past decade, but the number of accredited schools has remained fairly stable.[58]

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[56] A useful approach to shortage may be found in Rashi Fein, The Doctor Shortage (Washington, D.C.: The Brookings Institution, 1967). Also useful is the essay on the nursing shortage in Fred David (ed.), The Nursing Profession (New York: John Wiley, 1966). It is possible to make projections of manpower needs based on aspirational goals. Such an approach is being used by Leonard Lecht of the Center for Priority Analysis of the National Planning Association.

[57] Library Services for the Nation's Needs, p. 31.

The above statistics raise the question of, what is an accredited school? Full utilization of library services is relevant to the kind of training persons ought to receive. What do librarians do? How much of what they do can be performed better by some other group?

"To talk about a 'shortage' (what an inadequate word) of 100,000 librarians while maintaining this rigidity about educational qualifications makes our whole posture on the manpower situation little short of ridiculous."[59] It is quite unrealistic to continue to talk of shortages of graduates from the accredited schools as if these were the only source of supply. The solution to a library shortage, if one exists, is constrained by the manner in which a professional is defined. If a professional is only a person with a master's degree who graduates from an accredited college, then there is a rather sizeable shortage; however, when all sources of supply are considered and when these are compared with realistic concepts of need, then the shortages appear to shrink considerably.

The Ohio survey of public librarians shows that although 52 percent of the librarians in very large libraries (of over 500,000) have master's degrees, in the smaller libraries (those serving cities of 25,000 and over) 65 percent of the librarians have no degree at all.[60] The Ohio statistics appear to jibe with those from the National Opinion Research Center survey of April, 1966, which showed that 27 percent of all public librarians had obtained a master's degree. This survey estimated that 29 percent of the school librarians had completed this degree. Although the percentage will be much higher for academic and special librarians, the question must still be raised as to why a master's degree is essential for the school and public libraries if a considerable percentage of people working in those positions now do not have this degree. Projections of shortages based on master's level attainment for these libraries would be partly fictitious, or at least suspect.

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[58] Bowker Annual, 1965, p. 260

[59] Library Journal, XCII (May, 1967), 1781.

[60] Ralph Blasingame, Survey of Ohio Librarians and State Library Service (Columbus: State Library of Ohio, 1968).

Clearly, there is a place for a person with a bachelor's degree in library science in the library field and schools that train such persons ought to be accredited. Recognition of lower-level programs would free hundreds of library science teachers from offering technical courses and would enable them to return to their business of principles and research.

Librarianship is in competition with all other professions for personnel. The statistical analysis presented in the body of this report suggests that the level of income of a region has some effect on the number of persons who remain in the library field. Recognizing this, librarians should commence analytical work on the operation of the library that will restructure job descriptions and job requirements. Such an effort has commenced in the Federal government. It should be expanded to all phases of library work.

The above analysis points to the overriding conclusion that cries of rising shortages may be exaggerated and that the vacancy rates are tolerable. A report of the Conservation of Human Resources Project of Columbia University agrees with this assessment,

It states:

> These data indicate that with respect to effective demand, that is with respect to the budgeted funds available for hiring personnel, the shortages are within tolerable limits. This conclusion, based on gross data, does not reflect of course the serious pressure on certain libraries because of their inability to fill strategic positions, such as competent cataloguers.[61]

Frarey too seems to detect a diminution in the supply-demand gap: "About the most that can be said with any degree of accuracy is simply that the demand for librarians still exceeds the supply, although there are straws in the wind that the shortage may be lessening somewhat."[62]

Librarians themselves have seen the shortcomings of some of their own shortage statistics. Dan Lacy states that there are probably hundreds of thousands of positions in American libraries that require more than clerical skill but less than professional training. Particularly in school libraries, the only hope for providing the service is to call on the reservoir of teachers who have some library training, but no professional degrees.[63]

The shortages are also intimately related to the educational requirements of the positions. In the library field the market economy indicates that professional requirements may be too high. Thousands of persons are working as librarians without degrees, and 40 percent of all library graduates are from non-accredited schools. Those very conditions prompted the attendants at a meeting of the Middle-Atlantic Library Association to recommend that "The basic qualification for librarians be established as a bachelor's degree from a recognized four-year college, which includes successful completion of courses prescribed for initial education in library science."[64]

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[61] Eli Ginsberg and Carol A. Brown, *Manpower for Library Services*, prepared under contract with the U.S. Office of Education, September, 1967, p. 46.

[62] Frarey and Rosenstein, "Placements and Salaries in 1967," p. 2446

[63] Dan Lacy, "Statistics and Possible New Library Legislation," National Conference on Library Statistics, ALA, 1967, p. 17.

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[64] Kenneth F. Duchac, "Manpower: A Proposal", *Library Journal*, XCII (May 1, 1966), 1798.

VI. DATA NEEDS

The problems of analyzing current library statistics are made difficult by the very unsophisticated nature of the data and the cavalier approach to the presentation of tabular information. We must emphasize the importance of consistent definitions of data from one year to the next. In our study we have found a high incidence of incomparability of data over time and this handicapped our analysis and often prevented us from making meaningful comparisons. Drennan and Reed found that less than 1 percent of the librarians specialized in mathematics, statistics, engineering or science[65] -- the very fields for which the quality of the information is most crucial. It may be useful to document examples of sloppy reporting because for those of us who are attempting to analyze manpower trends, the data gaps circumscribe our methodologies. This criticism may also be considered another recommendation for librarians to "know thyself." Unless more information is available, leaders in the library field will continue to grope in statistical darkness.

To cite some of the problems involved, in our search for data, we found totals that are different from the sum of parts, tables without dates or sources, definitional changes without comment, table dates that are for date of publication, not for time of survey, and omissions or inclusion of certain categories for certain years only (for example, librarians with X number of hours of credit may or may not be counted, likewise for full-time equivalents). We also found estimates not marked as such, conflicting statistics for a particular item in the same volume (see for example, totals for special library expenditures in Bowker Annual, 1967, pp. 5 and 39), and 1964 salary means for academic libraries that were lower than the 1962 figures given by the same agency -- clearly, an impossibility. Professor William Baumol, working for the National Advisory Commission on Libraries, learned (too late) that for some library surveys costs were reported as zero (!) when no report was received by the investigator.

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[65] Henry T. Drennan and Sarah R. Reed, "Library Manpower," ALA Bulletin (September, 1967), 957-965

The "National Conference on Library Statistics" dealt with some of the above issues.[66] A few quotations from this report show the magnitude of the data problem: "Definitions vary from state to state and program to program" (p. 30); "A lack of comparability among academic institutions in reporting statistics" (p. 31); "there is need for "more up to date figures on vacancies" (p. 15); "Existing library data and concepts serve only for administration, budgeting, fiscal and legislative planning" (p. 57); "There may be a lack of current and historical compatibility in statistics reported by separate divisions of one agency, by agencies in an area operating similar programs" (p. 60).

The National Advisory Commission on Libraries reports:[67]

> The pitiful incompleteness and tardiness of library statistics, and their lack of comparability, make it impossible to give specific quantitative responses to this series of questions. No one knows precisely, or even with close approximation, what the total present library expenditures of the nation are, or even what the Federal contributions to those expenditures are -- nor can even approximately reliable specific estimates be made of the costs of remedying the serious deficiencies in library service that we all know exist.

To fill the above data gaps, we recommend that the following kinds of information be collected on a regular basis:

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[66] A Conference Co-sponsored by the American Library Association and the U.S. Office of Education, June 6-8, 1966, Chicago, Illinois.

[67] Library Services for the Nation's Needs, p. 9.

1. Employment data by categories (professional, non-professional, public, private, type of institution, region).

2. Output of library schools of all types (junior college, four-year programs, accredited schools).

3. Number of students enrolled and graduates from accredited and non-accredited schools (including junior colleges).

4. Salary data by type of library and by position, collected annually.

5. Annual data on size of faculty by type of institution.

6. Cost of library school education (to make comparisons with non-library programs).

7. Expenditure data by type of library (especially book expenditures, salaries, capital).

VII. SOME AREAS OF FUTURE RESEARCH

Our findings in the cross-section analysis make us suspect that there is little mobility of public and public school librarians into the academic-library field, although the opposite may not hold. This leads us to the conclusion that we need a separate study of the factors affecting the employment of public and/or public school librarians. Such a study could parallel the one reported above for academic librarians. We could attempt to explain the employment of public librarians by using public library expenditures, salaries, people served and per-capita income as explanatory variables.

A second area that is waiting to be researched is the growth of junior college library programs. As stated above, these programs grew from 24 in 1965 to 117 in 1967. There is a need to follow up the Martinson study. We need to know how may are in these programs, how many are transferring to regular library studies, how many are graduating, how many are working as librarians and where.

A final area for future research is a comparison of the programs, graduates and employment of persons from accredited and non-accredited schools. Accreditation of a school implies that the program is a superior to one in a non-accredited school. If the graduates of both schools are doing similar work for similar pay, it would cast serious doubt on the validity of the accreditation process and would suggest that additional schools ought to be accredited.

VIII. ADDITIONAL READINGS

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